### ENGINEERING INVESTIGATIONS AT **INACTIVE HAZARDOUS WASTE SITES**

### PHASE II INVESTIGATION

**VOLUME I** 

NYD980534820

Nash Road Landfill

Site No. 932054

Town of Wheatfield

Niagara County

Date: July 1985



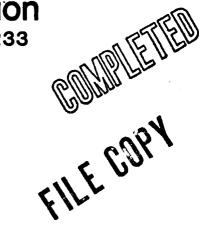
### Prepared for: New York State Department of **Environmental Conservation**

50 Wolf Road, Albany, New York 12233 Henry G. Williams, Commissioner

Division of Solid and Hazardous Waste Norman H. Nosenchuck, P.E., Director

By:

**ENGINEERING-SCIENCE** In Association With DAMES & MOORE





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### SECTION I

### **EXECUTIVE SUMMARY**

The Nash Road site is an inactive landfill located in the Town of Wheatfield, Niagara County (NYS), adjacent to the North Tonawanda City boundary (Figure I.1). The site is rectangular, totaling approximately 25 acres. The Nash Road site is located in a suburban residential area, and is partly overgrown with trees and marsh vegetation. Nearby residents use the site as a jogging area, dirt bike track, and play area.

The Nash Road site was operated as a landfill by Niagara Sanitation Company between 1964 and 1968. Both municipal and industrial wastes, including caustic materials and sludges, are disposed at the site. In addition, between 6/6/68 and 7/15/68, approximately 900 cubic yards of waste material from a sewer excavation at the Love Canal site was disposed in an excavated trench on this site (memo of 8/9/78 to Hennessey, NYSDOT).

Although some wastes are covered, protruding refuse is visible from the ground surface. Current concern centers on the possible lack of containment of the waste and the migration of these wastes offsite.

The Phase II investigation included surface water, sediment, and groundwater sampling and analyses in order to identify the occurrence and location of contaminants and to assess the potential hazard associated with the landfill site (Figure I.2).

Seven onsite groundwater wells were installed and aquifer testing was performed. Water samples were tested for the 15 Love Canal indicator parameters (methylene chloride, chloroform, carbon tetrachloride, benzene, toluene, chlorobenzene, 1,1,2-trichloroethane, tetrachloroethene, 1,1,2,2-tetrachloroethane, trichloroethene, trichlorobenzene (and isomers), dichlorobenzene (and isomers), hexachlorobutadiene, total organic halogens and pH). Sediment samples were tested for the 15 indicator parameters and for Pb, Cr, Cd, Cu, CN, Hg, Ni, and Zn. Geophysical surveys and downhole geophysics were used to help delineate the details of subsurface hydrogeology.

Site stratigraphy can be summarized as follows:

mixed sand/waste fill silt (MC) upper sand (SP) clay (CH and CL with sand seams) lower sand (SP) till (GM) dolomite bedrock

Most waste was mixed with and covered by the upper sand. The disposal trench for Love Canal waste was excavated through the sand into the clay unit.

The monitoring well screens were placed in the till and the silt/upper sand units. The piezometric surface within the fill shows a groundwater high beneath the north-center part of the site.

Surface water samples were found to contain low levels of methylene chloride and total organic halogens; no other contaminants were detected. Sediment taken from dried shallow puddles showed low levels of metals.

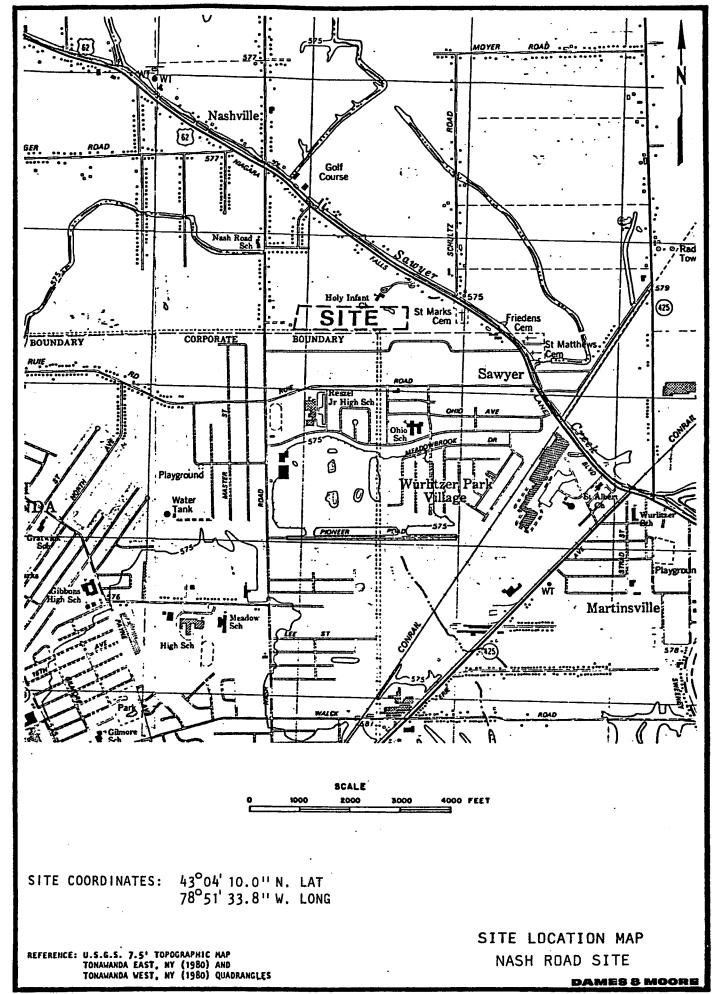
Limited analyses of ground water samples from new on-site monitoring wells indicated no organic contamination. One offsite residential well, approximately 80 feet deep, was analyzed for all priority pollutants; the analyses show metal contamination. An earlier USGS study showed metal contamination in the shallow aquifer.

Based upon the results of this study and previous studies, the HRS scores for the Nash Road site have been calculated as follows:

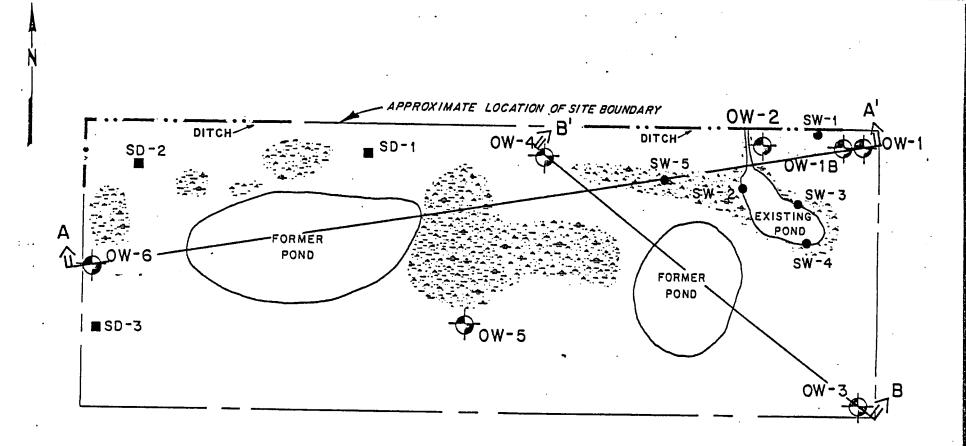
$$S_{M} = 5.37$$

$$S_{FE} = 26.25$$

$$S_{DC} = 37.50$$



BY D. Tomas DATE 8/3/84



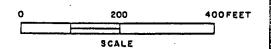
### EXPLANATION:

- SEDIMENT SAMPLE
- SURFACE WATER SAMPLE
- SAMPLING WELL

OW-1"

NOTE | OSTERMAN WELL IS LOCATED APPROXIMATELY 1000 FEET WEST OF SITE.

PLOT PLAN
SHOWING CROSS SECTION LOCATIONS
NASH ROAD SITE



### SECTION II

### PURPOSE

### Purposes

The Nash Road site is an inactive disposal area containing municipal wastes and industrial wastes, including waste materials from a sewer excavation at the Love Canal site. Disposal has occurred in and above lacustrine sands and clays; there are no engineered containment facilities on the site.

The purposes of the Nash Road Phase II Site investigation were 1) to identify the presence and location of any hazardous substance migrating from the site, 2) to determine if any imminent hazard exists, 3) to gather necessary information and to complete the HRS scoring, and 4) to prepare a site investigation report.

### SECTION III

### SCOPE OF WORK

### Scope of Work

Phase II investigations at the Nash Road site were begun in June, 1983 in conjunction with Phase I investigation and are ongoing as of the date of this report. The scope of the investigation was originally presented in the Phase I report (June, 1983) and later in the Quality Assurance Project Plan for Nash Road and Solvent Chemical Sites (March, 1984). During the performance of the field investigation, the scope of the work was expanded at the request of the NYSDEC, in order to obtain a more comprehensive understanding of the entire Nash Road landfill.

The scope of our investigation is summarized in tabular form on Table III.1 and is summarized below.

### <u>Step l - Emergency Evaluation Surface Water</u>

A surface water monitoring program was implemented in June 1983 to determine if any imminent hazard exists at the site and to evaluate the movement of surface contaminants in a northerly and northeasterly direction. Five surface water samples were collected around the ponds (including trench) and ditch in the eastern part of the site (see Figure III.1). These samples were analyzed for the 15 indicator parameters (methylene chloride, chloroform, carbon tetrachloride, benzene, toluene, chlorobenzene, 1,1,2-trichloroethane, tetrachloroethene, 1,1,2,2-tetrachloroethane, trichloroethylene, trichlorobenzene (and isomers), dichlorobenzene (and isomers), hexachlorobutadiene,

total organic halogens, and pH). The procedure for collecting the samples is discussed in Appendix A. The results of these analyses are presented in Appendix D and are discussed in Section IV.

### Step 2 - Site Investigation

Geophysical Survey (east end) - Resistivity and magnetometer surveys were performed in late May 1984 to define the boundaries and depth of the disposal trench, to identify the presence of buried metal objects, to provide stratigraphic information, and to evaluate the presence of a contaminant plume. Prior to the survey, standing water was drained from the site in order to provide access for the field team.

The magnetic survey of the Nash Road site was conducted using a 40-foot grid pattern over the entire site. A north-south orientation was used on the traverses across the site. The magnetic base station was located offsite in a wooded area west of the site.

The electrical resistivity (ER) survey of the Nash Road site was conducted using both soundings and profiles. Soundings were conducted first to a depth of 100 feet in order to interpret geologic and stratigraphic features. Other soundings were conducted to a depth of 30 feet and others only as deep as necessary to distinguish lenses of interest. Profiles were conducted at electrode spacings of 10, 20, 30, 50, and 70 feet.

Figure III.2 shows the location of the ER sounding and profile stations. Field procedures are outlined in Appendix A. Magnetometer, sounding, and profile field data are included in Appendix C.

Groundwater Monitoring - A network of five deep and two shallow groundwater sampling wells was installed in June 1984. The locations of the wells were chosen to provide information about the geology of the subsurface and the groundwater flow regime at the entire Nash Road Landfill (see Figure III.1). Soil was drilled and sampled from the ground surface to the top of the bedrock. Stainless steel wells were installed with filter sand packs, and primary and secondary bentonite seals.

Each well was logged visually during drilling and later with a downhole gamma logging unit. Additionally, aquifer characteristics were evaluated by means of in-situ falling head permeability tests and routine water level measurements. To further characterize the lithology of the site soils, a grain size analysis of each soil unit was performed in the laboratory, according to ASTM D-422-63.

Groundwater samples were taken in July 1984 from the seven sampling wells and from a nearby unused residential well. Groundwater samples were analyzed for the 15 indicator parameters; the chemical analytical results are discussed in Section IV and listed in Appendix D. All field procedures are detailed in Appendix A. Boring logs and well schematics and

grain size analyses are included in Appendix B. Gamma logs are shown on Figures IV.16 and IV.17.

Sediment Sampling - Sediment samples were collected in July 1984 at three locations in the western part of the site, as shown on Figure III.1. It was originally planned that surface water would also be collected at these locations, but no surface water was present on this end of the site at the time of sampling. Locations of the sampling points are along the western and northern margins of the site and were chosen to complement the earlier surface water sampling network and to provide information about offsite surface movement of contaminants in a westerly and northerly direction. Sediments are being analyzed for Pb, Cr, Cu, Cd, CN, Hg, Ni, Zn, and organic priority pollutants. Results are discussed in Section IV and listed in Appendix D.

Air Survey - An HNU meter survey was performed during July 1984 to evaluate the presence of organic vapor contaminants. No contamination was detected. The procedure for this survey is described in Appendix A. Field data is presented in Appendix D.

### TABLE III.1

### WORK PLAN - TASK DESCRIPTION (as implemented) NIAGARA SANITATION, NASH ROAD

NIAGARA DANI	IATION AND ROLL
TASKS	DESCRIPTION OF TASK
Step 1 - Emergency Evaluation	
Perform Surface Water Sampling and Analyses	Inspect the site and collect 5 water samples around the disposal trench. Analyze the samples for methylene chloride, chloroform, carbon tetrachloride, benzene, toluene, chlorobenzene, 1,1,2-trichloroethane, tetrachloroethene, 1,1,2,2-tetrachloroethane, trichloroethene, trichlorobenzene (and isomers), dichlorobenzene (and isomers), hexachlorobutadiene, total organic halogens and pH.
Step 2 - Site Investigation	
II-A Update Work Plan	Review the information in the Phase I report, and Step 1 evaluation, and revise the Phase II work plan.
II-B Conduct Geophysical Studies	Conduct EM and resistivity to define the boundary and depth of the disposal trench and to provide hydrogeological information.
<pre>II-C Conduct Boring/Install     Monitoring Wells</pre>	Install 7 stainless steel sampling wells.
II-D Construct Test Pits/ Auger Holes	No further construction of test auger holes necessary.
II-E Perform Sampling and Analysis	
Soil samples from borings	Collect samples during drilling at 5-foot intervals or at changes in subsurface lithology. Perform grain size analysis of each lithologic unit on site.

Soil samples from No further sampling necessary.
surface soils
Soil samples from test No further sampling necessary.
pits and auger holes

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### DESCRIPTION OF TASK

surface water

Sediment samples from Collect 3 sediment samples at the west end and analyze samples for Pb, Cr, Cd, Cu, CN, Hg, Ni, Zn, and a GC/MS organic priority pollutant

Groundwater samples

Collect samples from the 7 new monitoring wells and analyze for the parameter listed in Step 1.

Surface water samples

No water at west end of site at time of investigation.

Air samples Using the HNU meter, determine if organic vapors are present.

Waste samples

No further sampling necessary.

II-F Calculate Final HRS

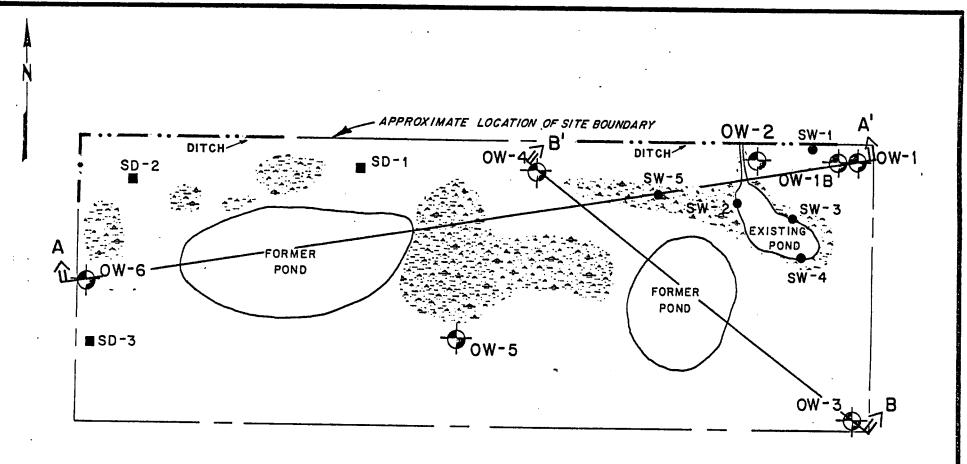
Revise HRS based on the field data collected in Tasks IIB-IIE, complete the HRS form.

II-G Conduct Site Assessment

Prepare final report containing Phase I report, additional field data, final HRS and HRS documentation records, and site assessments. The site assessment will consist of a conceptual evaluation of alternatives and a preliminary cost estimate of the most probable alternative.

II-H Project Management

Project coordination, administration and reporting.



### EXPLANATION:

- SEDIMENT SAMPLE
- SURFACE WATER SAMPLE
- SAMPLING WELL

OW-1

NOTE | OSTERMAN WELL IS LOCATED APPROXIMATELY 1000 FEET WEST OF SITE.

PLOT PLAN
SHOWING CROSS SECTION LOCATIONS
NASH ROAD SITE

400 FEET

SCALE

### SECTION IV

### SITE ASSESSMENT

### Site Topography

The site is an inactive landfill located in the Town of Wheatfield, Niagara County, adjacent to the North Tonawanda City boundary. The site is a rectangular area, twenty five acres in size. It is surrounded by a suburban residential area, and is partially overgrown with trees and marsh vegetation. Dirt roads provide access to and within the site.

The landfill is visible to many of the residential neighbors south of the site. It is used by nearby residents as a jogging area, dirt bike track, and general play area.

Access to the site is open and unguarded. National Fuel Gas Corporation has a facility adjacent to the western border of the site. A gas pipeline, a salt-brine pipeline, and above-ground electrical lines also pass through the site along the southern boundary.

Before landfilling began, the site was a swamp area with surface water drainage to the north toward Sawyer Creek. General surface features are shown on Figures IV.l and IV.2. Landfilling of wastes and excavation of a disposal trench (labelled "existing pond") has resulted in irregular ground surface topography. Relief on the site is greater than 10 feet.

The volume of onsite surface water fluctuates seasonally. In the

spring, approximately one-third of the site is underwater; in late summer, only the disposal trench and connected ponds are filled with water. The northern margin of the site is bounded in most parts by a ditch, which, in the spring, contains surface water. The large ponds and the disposal trench drain into this ditch.

During the field activities in May through July, 1984, abundant wildlife was observed on the site, including birds, rabbits, frogs, turtles. No human use of surface water was observed. Groundwater is similarly unused, although an older home adjacent to the site has a (unused) residential water well. It is possible that other older homes in the vicinity of the landfill have residential wells. (Niagara Co. Dept. of Health is unaware of any other existing wells.) All nearby residents presently are supplied with municipal drinking water.

### Site Hydrogeology

### Regional Geology

The Nash Road Site is located in the Erie-Ontario Lowlands physiographic province. The bedrock of this region is predominantly limestone, dolostone, and shale.

In the recent past, most of New York State, including the site, has been repeatedly covered by a series of continental ice sheets. The activity of the glacier widened preexisting valleys and deposited widespread accumulations of till. The melting of ice, ending approximately 12,000 years ago, produced large

volumes of meltwater; this water subsequently shaped channels and deposited thick accumulations of stratified, granular sediments.

As glacial ice retreated from the region, meltwater formed lakes in front of the ice margin. This region is covered by lake sediments, the most recent being from Lake Tonawanda, an elongate lake which occupied an east-west valley and drained north into Lake Iroquois. The sediments consist of blanket sands and beach ridges which are occasionally interlayered with lacustrine silts and clays.

Granular deposits in this region frequently act as shallow aquifers, whereas lacustrine clays, as well as tills, often inhibit groundwater movement. However, fine-grained, water-lain sediments, such as silts and clays, frequently contain horizontal laminations and sand seams. These internal features facilitate lateral groundwater movement through otherwise low permeability materials.

### Site Geology

This analysis is based on subsurface information from the drilling program, downhole gamma logging and geophysical surveys and sounding of the site. Also used in this analysis were the USGS shallow borings made in 1982.

Bedrock is Lockport Dolostone, occurring at depths varying from

65 feet to 71 feet below the ground surface. The surface of the
bedrock slopes generally northward (Figure IV.3) and forms a

north-trending channel in the center of the site. An ER profile of the 70-foot deep surface (Figure IV.4) resulted in electrical values indicative of bedrock. Values south of the disposal trench, as seen on Figure IV.4 and all ER profiles are numerically lower and suggest a wet area.

A till unit is located immediately above the bedrock surface. The till is a pink, very dense, silt and gravel with some sand. Grain size analyses show silt contents as great as 65%. Gravel size increases to the west. The till blankets the site with an average thickness of 25 feet. The 50-foot deep surface, which occurs within the till, has been mapped with ER profiling (Figure IV.5). The values are relatively consistent, except again for the low values south of the disposal trench. The top surface of the till, as shown on Figure IV.6, forms a channel trending generally northwest, with a maximum relief across the study area of 17 feet.

Overlying the till is a lower sand unit. A grain size analysis of the unit indicates that it is a fine sand with approximately 35% silt. This sand unit does not blanket the site, but rather occurs as a wedge-shaped unit, thickening to the north-center part of the site (Figure IV.7). At the western and eastern margin of the site, the sand unit has a thickness of less than one foot. An ER profile map of the 30-foot deep surface (Figure IV.8), which corresponds approximately with the depth of the lower sand, shows lower values south of the trench. Again, these can be interpreted as an increased water content of the soils in

this area. Based on its lithology and stratigraphic position, this sand unit is interpreted to be an early deposit of Lake Tonawanda.

Above the lower sand and blanketing the site is a layered "fat" clay unit which grades vertically into a layered silty "lean" clay. Both of these units contain numerous sand seams. Hydrometer analyses of these fat and lean clays confirm the vertically increasing silt content. These clay units are classic examples of Lake Tonawanda deposits, as mapped by Muller (1977). The most likely mineralogy for the clay minerals is illite. Two ER profile maps of the 20-foot deep and 10-foot deep surfaces (both of which are within this clay unit) show, again, an area south of the trench with distinctly low resistivity values. This again is interpreted as the result of increased water content. Contours on the top surface of the upper clay unit, as shown on Figure IV.11, show a surface sloping gently north and west; maximum relief is 3 feet.

An upper sand unit is located immediately above the clay unit, in all parts of the site except in the northeast corner. This sand unit varies in thickness from greater than 8 feet in the southwest to 0 feet in the northeast (Figure IV.12). A grain size analysis of this unit indicates a fine sand with approximately 20% silt. This unit probably originated as a late deposit of Lake Tonawanda.

In the eastern part of this site, the upper sand is overlain by a

layered silt. A grain size analysis of this silt shows that it contains approximately 20% sand and little clay. During testing, a suspension of this silt was extremely frothy and had a soapy odor. The occurrence of this fine-grained unit suggests a possible deepening of the Lake Tonawanda water.

The uppermost unit on the site is a mixed sand/waste fill. This unit is defined best from the results of the magnetometer survey. Readings on the site were highly variable due to the disturbed soil, landfill type debris and buried metallic objects. On Figure IV.13, the areas of very high magnetic readings (greater than 58,000 gammas) are interpreted as buried ferromagnetic metal objects. The magnetic readings of 57,500 gammas are interpreted as disturbed soil areas and possibly buried ferromagnetic metal objects.

The magnetic data indicates that there are five areas on the landfill that may be underlain by buried ferromagnetic metal objects. The data also suggest that the landfill has several distinct areas of disturbed soil, i.e., pits and/or trenches, and mixed soil/waste fill. Samples taken during drilling support this interpretation.

The stratigraphic relationship between the units can be seen on the cross sections prepared from boring logs (Figures IV.14 and IV.15). The locations of these lines are shown on the Plot Plan (Figure III.1). The sand/waste mixed fill covers part of the ground surface and is underlain by the upper sand or the clayey

silt. In virgin areas, the ground surface is either silt or sand. Excavation of the disposal trench, not shown on the cross section, would have exposed the fat clay in the base of the trench.

Cross sections have also been prepared based on gamma log records (Figures IV.16 and IV.17). These cross sections show the same stratigraphy as those based on boring logs, as well as some finer detail and time lines. For example, peaks A and B are on approximately horizontal lines suggesting site-wide thin sand seams within the lacustrine clay. Similarly, peak C corresponds to the occurrence of the lower sand unit and peak E to the upper sand and sand/waste fill units. It should be noted that the gamma log responses of the upper sand unit and the fill/sand unit are the same due to the presence of the sand. These units are plotted together on the gamma log cross sections.

A cross section based on ER sounding values has been prepared and is shown on Figure IV.18. The location of this cross section line is shown on Figure IV.19. On the cross section, all lithologic units are discernable. In addition, a "wet zone" is indicated between depths of 16 feet and 26 feet, sloping to the north. This ER peak corresponds roughly with the depths of peak B on the gamma log cross sections and therefore may indicate a silt or other low gamma count density material. Boring logs (OW-1 and OW-3) show this depth range to be a very soft wet clay. This anomaly is of particular interest to the study because it coincides with the approximate depth of the disposal trench.

### Hydrology

To date, the hydrology of the Nash Road site is known from insitu permeability tests, groundwater elevation measurements, surface and groundwater chemical information, and interpretations from the subsurface geology.

### Surface Water Hydrology:

The occurrence and location of surface water on the Nash Road site is variable and seasonal. Most surface water bodies occur in small enclosed depressions, less than 3 feet deep. They are formed by either snow meltwater or rainwater and generally disappear, due to evaporation, during the summer months. Water in these ponds was observed to be either clear or rust-colored. Most of these ponds are rimmed with marsh-type vegetation. Due to their temporal and enclosed nature, no water samples were taken in these ponds.

In contrast to the small ponds, several large connected ponds, including one which was a disposal trench, are located in the northeast section of the site and contain water year-round. The color of this water is clear, with occasional patches of green floating algae and weeds. The edges of these ponds are rimmed with marsh-like vegetation. Rusty barrels and other debris can be seen floating in these ponds. Nearby residents reported to our field team that these ponds do not freeze in the winter. In the spring and early summer, these ponds drain into a ditch along the northern margin of the site.

Groundwater Hydrology:

Permeabilities for the various screened units are shown in Table IV.1. The magnitudes of the values are typical of the corresponding soil lithologies. The till/bedrock interface permeability is variable, depending upon the degree of fracture of the bedrock and the sand and gravel content of the till.

The piezometric surface within the till is mapped on Figure IV.20. The configuration of the contours suggests a groundwater mound beneath the center of the site. This mound may be attributable to the occurrence of the lower sand unit, immediately above the till, acting as a source of recharge for the till.

The thick, soft clay unit above the lower sand may act as an aquitard, thus allowing only lateral recharge of the lower sand unit. Alternately, the clay may be permeable due to its soft (low density) consistency and layered fabric with numerous sand seams (see gamma logs). Additionally, the excavation of the disposal trench removed part of the clay unit and possibly disturbed the clay floor of the trench during the drag-line excavation procedure. This activity may have opened a new flow path by which surface water now may be connected with sand seams in the clay and possibly with the lower sand unit.

The upper sand unit probably forms a shallow aquifer, although no wells were placed in this unit. Based on our interpretation of the upper clay unit surface geometry (Figure IV.11), we expect

that flow direction within the shallow aquifer to follow the contours of the underlying clay unit. Again, this clay unit has been partially excavated in the trench, thereby providing a connection between the upper aquifer and trench water, and, by extension, possibly into the lower aquifer.

### Contamination

Contamination of the environment within the site boundaries has been evaluated by chemical analyses of surface water, sediment, and groundwater samples and an HNU air quality survey. Migration of contamination away from the site is assessed by chemical analyses of surface water and one nearby (unused) residential well, as well as our interpretation of groundwater and surface water flow characteristics.

### Surface Water Contamination

Water samples from ponds and from the ditch were analyzed in July 1983, as an emergency measure to assess the migration of contamination off-site via a surface water pathway. The results of these analyses are shown on Table IV.2. The samples were analyzed for the indicator parameters. Only very low levels of total organic halogens and methylene chloride were found. The ditch water sample had slightly greater levels than any of the pond and trench samples. This may indicate another subsurface or surface water source to the ditch, either west or north of the site. The TOX values (10 ppb and less) could be indicative of background levels. Alternately, the low levels of methylene chloride could be due to the laboratory contamination. These

chemical analyses were performed without complete quality assurance procedures due to the emergency response nature of this part of the study.

A sample of ponded water was collected by Region 9 DEC on July 11, 1983 and analyzed for GC/MS organics. Two compounds were identified at low concentrations including: Diethylphthalate (identified) and Toluene (42.7 ug/l).

From these analyses, no significant surface water contamination from organic indicator pollutants is believed to exist at the eastern end of the site.

### Sediment Contamination

In the summer of 1984, three sediment samples were taken from "dried puddles" in the western end of the site (see Figure III.1 for sampling locations). These samples were analyzed for organic priority pollutants and metals. The results of these analyses are presented in Table IV.3. Also presented in this table are ranges of concentrations of metals in non-contaminated soils. The values for cadmium, chromium, copper, lead, nickel and zinc are all within the range of "typical" soils. Also there is no significant variation between the values for different sampling locations. Values for mercury and cyanide were not presented in Friberg, Nordberg and Vouk (1979); however, the values of cyanide are less than the detection limit. Mercury was detected at very low levels. Based on the results of the analysis of these

samples, no sediment contamination is believed to exist at the site.

### Groundwater Contamination

Seven on-site monitoring wells and one nearby off-site unused residential well (Osterman well) were sampled in the summer of 1984. The on-site wells were analyzed for volatile organics, base/neutral extractable organics, total organic halogens and pH. The results of compounds that were detected are presented on Table IV.4. Based on the results of these analyses, no significant organic contamination is believed to exist at the site.

The Osterman well sample was analyzed for priority pollutants (volatiles, acid extractables, base/neutral extractables, pesticides/PCBs, metals, cyanides and phenolics). The results of the analyses for organics that were detected are presented in Table IV.4. The results of analysis of two samples for metal are presented in Table IV.5. Only metals that were detected in at least one of the ground water samples are presented in this table.

Lead was found in one of these two Osterman well samples at levels in excess of the New York State Class GA water quality standard (25 ug/l). However, in the other sample the concentration of lead was less than the detection limit. Cadmium was detected in both samples. The concentration in one of the samples was at the water quality limit (10 ug/l) and the

concentration in the other sample was less than the water quality limit. The concentrations of other metals were below water quality limits. It should be noted that the analytical results presented in Table IV.5 are total metals on unfiltered samples and that the monitoring well samples were not analyzed for metals. Additional sampling is required to determine if metals contamination exists at the site and to determine whether or not the contamination is migrating from the site.

### Air Contamination

An HNU air quality survey was performed in the summer of 1984 and nor airborne organic contaminants were detected.

### TABLE IV.1

### Summary In-Situ Permeability

Well	Permeabili	Permeability cm/sec							
OW-1	$4.37 \times 10^{-4}$	silt							
OW-2	$6.75 \times 10^{-4}$	silt and sand							
OW-1B	$8.43 \times 10^{-7}$	till/bedrock							
OW-3	$1.43 \times 10^{-6}$	wet zone in till							
OW-4	7.88 $\times 10^{-7}$	till/bedrock							
OW-5	$7.5 \times 10^{-4}$	till/bedrock							
OW-6	$6.8 \times 10^{-4}$	till/bedrock							

TABLE IV.2

Analytical Results for Surface Water Samples

Parameter (ug/1)	SW-l	SW-2	sw-3	SW-4	SW-5
Methylene Chloride	11	<10	10	<10	<10
Chloroform	<10	<10	<10	<10	<10
Carbon Tetrachloride	<10	<10	<10	<10	<10
Benzene	<10	<10	<10	<10	<10
Toluene	<10	<10	<10	<10	<10
Chlorobenzene	<10	<10	<10	<10	<10
1,1,2,2,-trichloroeth	ane<10	<10	<10	<10	<10
Tetrachloroethane	<10	<10	<10	<10	<10
1,1,2,2,-tetrachloro- ethene	<10	<10	<10	<10	<10
Trichloroethene	<10	<10	<10	<10	<10
Trichlorobenzene (isomers)	<10	<10	<10	<10	<10
Dichlorobenzene (isomer)	<10	<10	<10	<10	<10
Hexchlorobutadiene	<10	<10	<10	<10	<10
рН	6.9	8.1	7.1	7.4	7.4
Total organic halogen	s 10.	5.	7.	7.	8.
				_	

(See Figure III.1 for location of sampling points)

TABLE IV.3
Analytical Results (1) for Sediment Samples

Parameter (ug/g)	SD-1	Sample No. SD-2	SD-3	Range of Concentration in non-contaminated soils(2)			
Cadmium	0.30	< .2	< .2	<1			
Chromium	6.8	6.3	5.6	trace to 250			
Copper	5.7	8.2	10.0	2 to 100			
Lead	18.	7.0	14.	2 to 200			
Mercury	0.0084	0.064	0.010	(3)			
Nickel	6.5	8.5	9.4	3 to 1,000			
Zinc	40.	34.	48.	10 to 300			
Cyanide	<1	<1	<1	(3)			

- (1) Samples were analyzed for volatile organics, acid and base/neutral extractable organics and pesticides/PCB's. All results for organics analysis were less than detection limits
- (2) Source: Handbook on the Toxicology of Metals, Edited by L. Friberg, G. F. Nordberg and V. Vouck, 1979.
- (3) No information for this parameter available in Friberg, Nordberg, and Vouk (1979) (See Figure III.1 for location of sampling points)

TABLE IV.4

ANALYTICAL RESULTS (ORGANICS AND pH) FOR GROUND WATER SAMPLES

### SAMPLE IDENTIFICATION

Parameter	OW-1	OW-1B	OW-2	OW-3	OW-4	OW-5	OW-6	FT-1	Osterman Well	Osterman Property	OST-1
Methylene Chloride (ug/l)	ND	ND	ND	ND	ND	ND	15	ND	ИD	ND	14
Toluene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	<6.0	ND	ND
<pre>1,1,1,- trichloroethane (ug/1)</pre>	ND	<3.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzylphthalate (ug/1)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33
Total Organic Halides (mg/l)	<0.02	<0.02	0.04	0.04	0.09	<0.02	Ø.12		Ø.Ø4		==
рн	8.05	8.14	8.12	8.11	8.14	8.16	8.07	6.45	8.20		

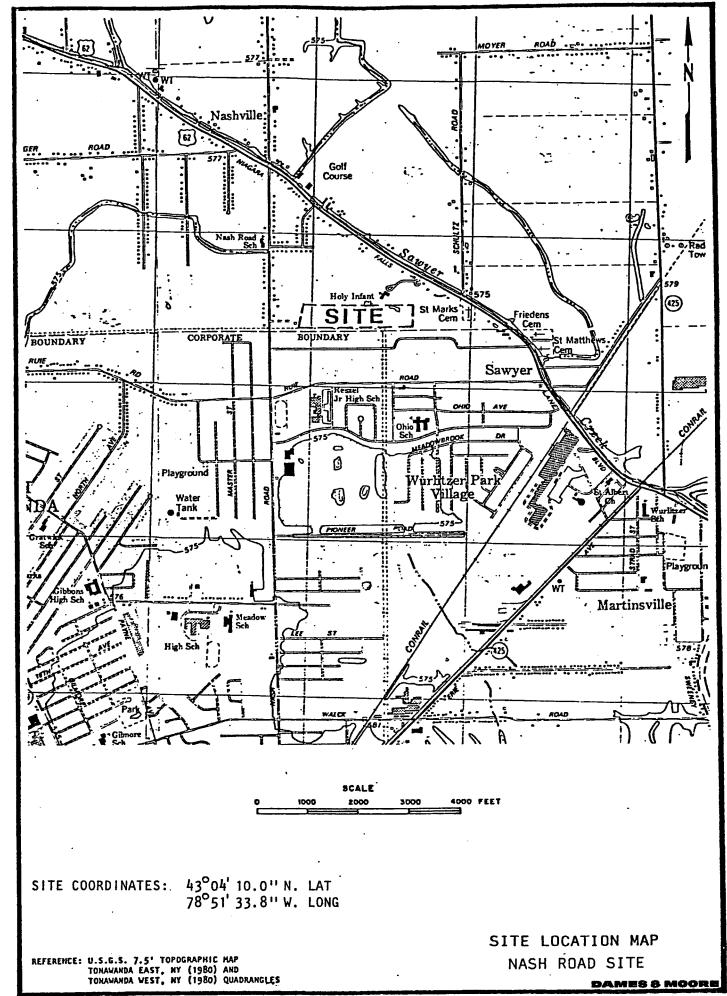
ND = Not Detected

TABLE IV.5

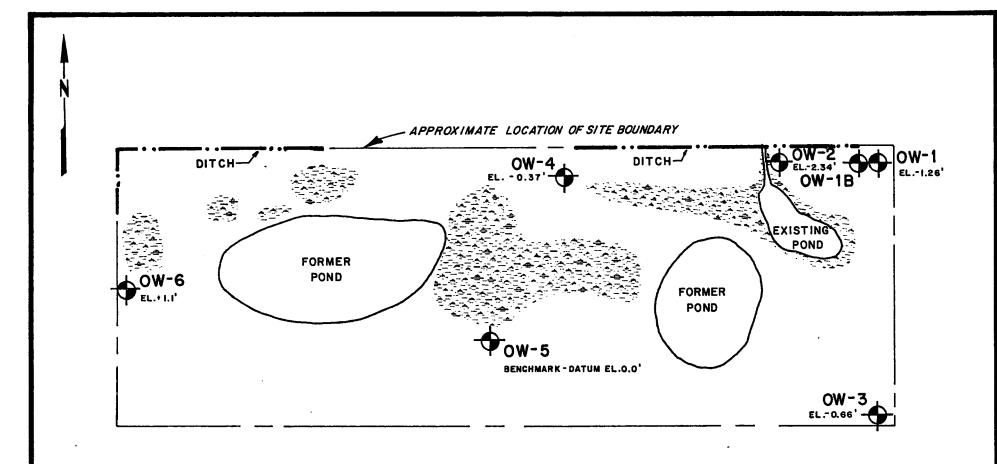
#### Results of Metals Analysis For Osterman Well

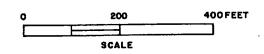
### Sample Identification

Parameter	Osterman Property	OST-1	Class GA Water Quality Standards		
Total Cadmium (ug/l)	6	10	10		
Total Copper (ug/1)	13	10	1,000		
Total Zinc (ug/l)	258	50	5,000		
Total Lead (ug/l)	<5	140	25		
Total Mercury (ug/l)	<0.5	Ø.8	2		



BY 0 - ma DATE 7/25/84





SURFACE TOPOGRAPHY
NASH ROAD SITE

Note: Elevation values in feet relative to arbitrary datum

FILE 3305 -003 19

BY 9. Tance DATE 7/85/84

PPROXIMATE LOCATION OF SITE BOUNDARY DITCH-FORMER POND FORMER POND OW-3 400FEET 200 SCALE DEPTH TO BEDROCK SURFACE NASH ROAD SITE Note: Values in feet below arbitrary datum.

NIAGARA SANITATION -NASH ROAD SITE

### **ER PROFILE MAP**

(Electrode Spacing =70 feet)

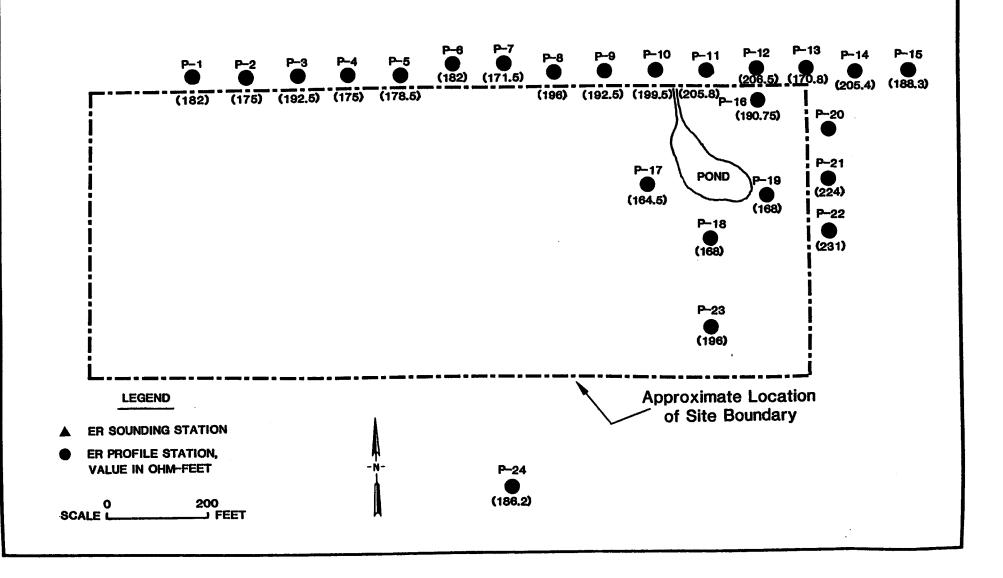
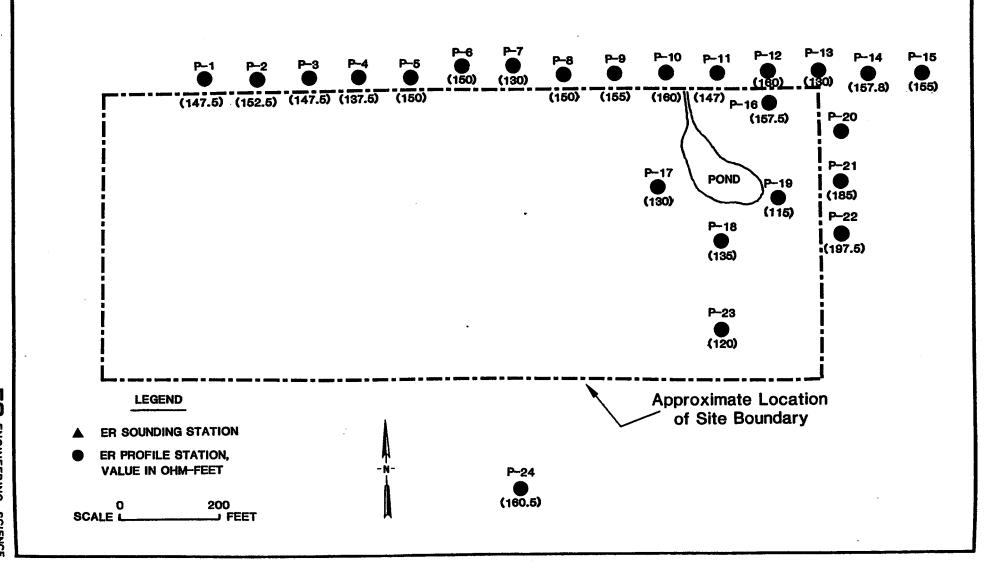


FIGURE TV. 4

NIAGARA SANITATION -NASH ROAD SITE

### **ER PROFILE MAP**

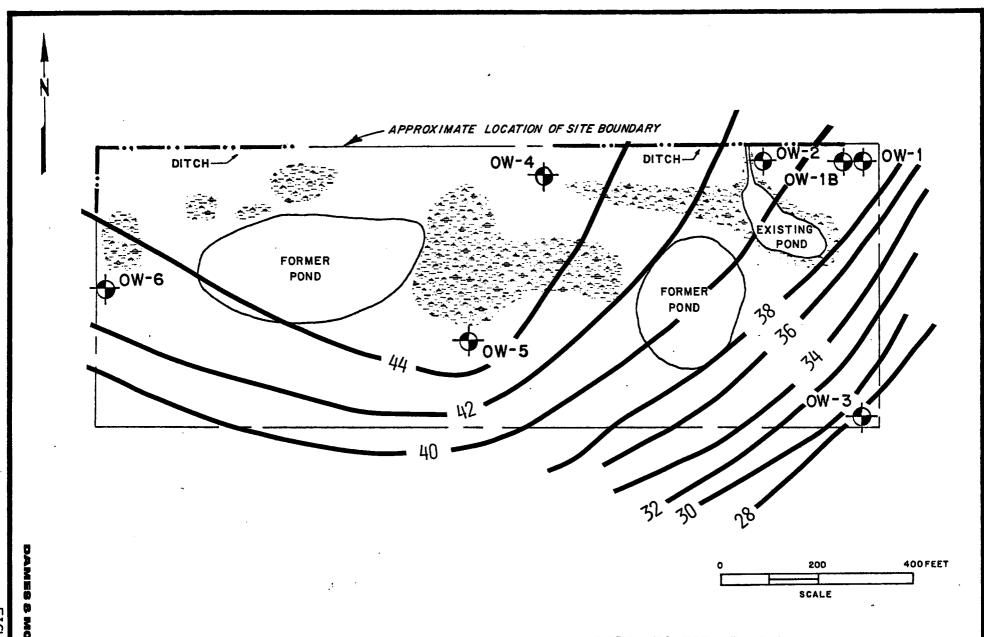
(Electrode Spacing =50 feet)



ES ENGINEERING-SCIENCE FIGURE IX.5

FILE 13305-003 19

BY D. Toma DATE 7/26/84



URM IV

Note: Values in feet below arbitrary datum.

DEPTH TO TOP OF TILL
NASH ROAD SITE

FILE (3365-008/19

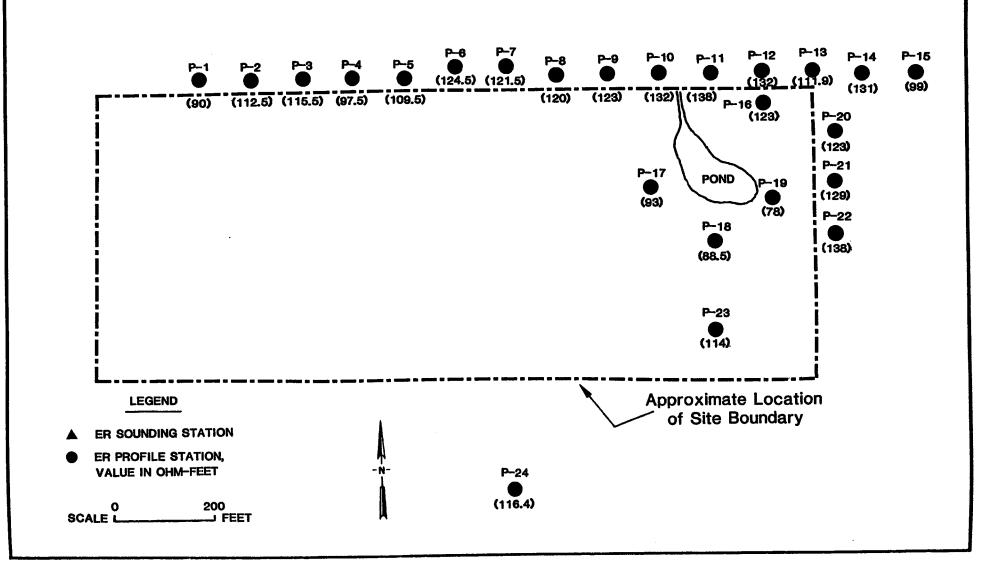
BY D. WARDE DATE 7/25/84

APPROXIMATE LOCATION OF SITE BOUNDARY **△** OW-1 FORMER POND **FORMER** POND OW-3 400FEET FIGURE SCALE LOWER SAND ISOPACHS NASH ROAD SITE Note: Values in feet

NIAGARA SANITATION -NASH ROAD SITE

## **ER PROFILE MAP**

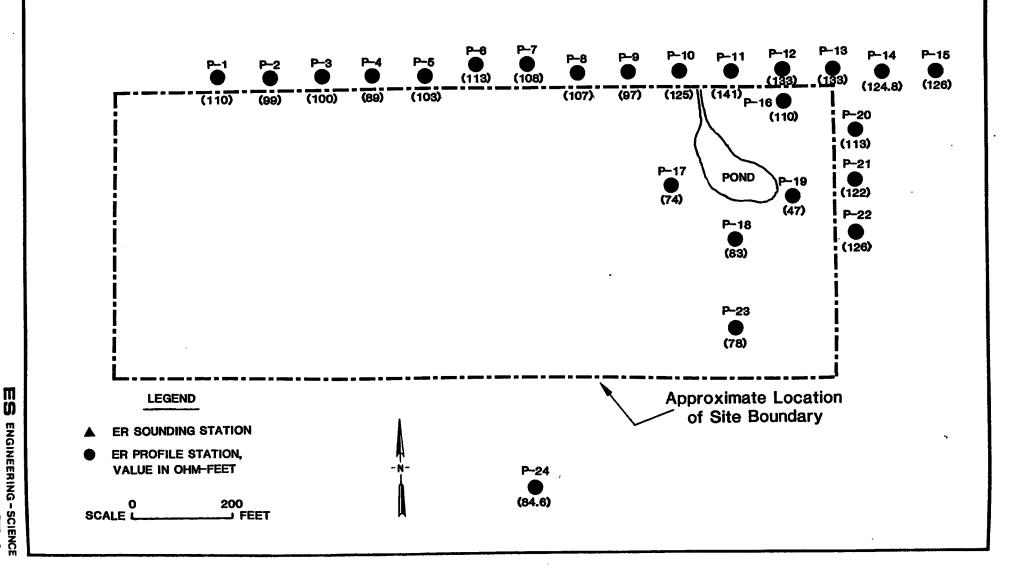
(Electrode Spacing = 30 feet)

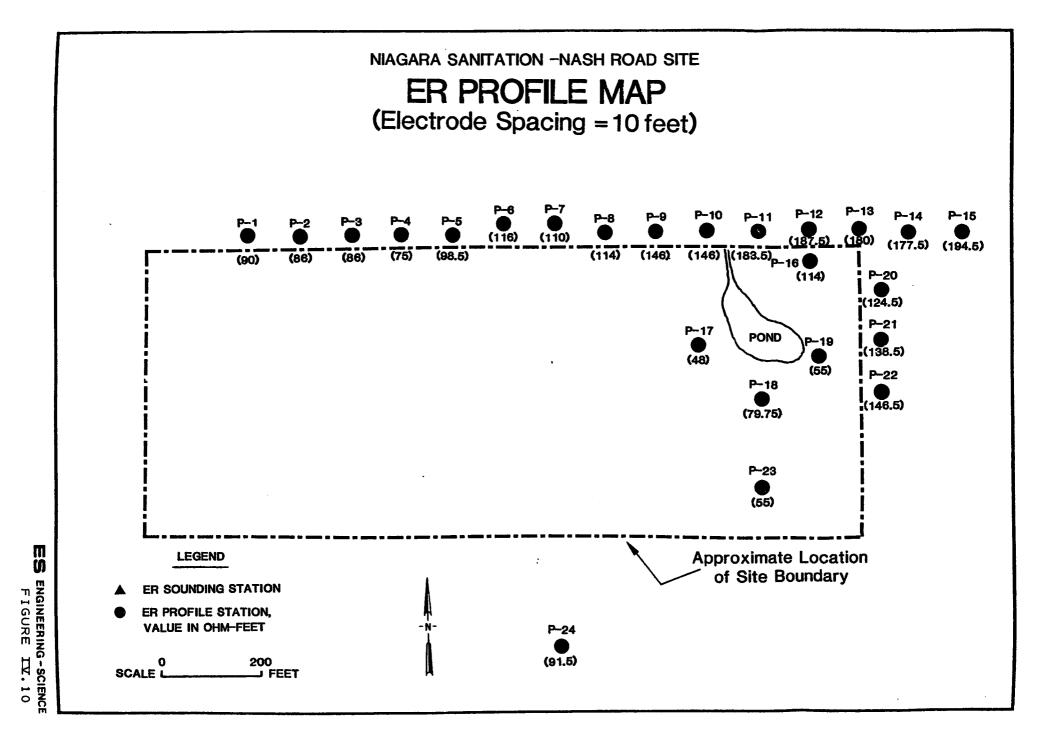


**NIAGARA SANITATION -NASH ROAD SITE** 

## **ER PROFILE MAP**

(Electrode Spacing = 20 feet)





FILE 13305 1003 17

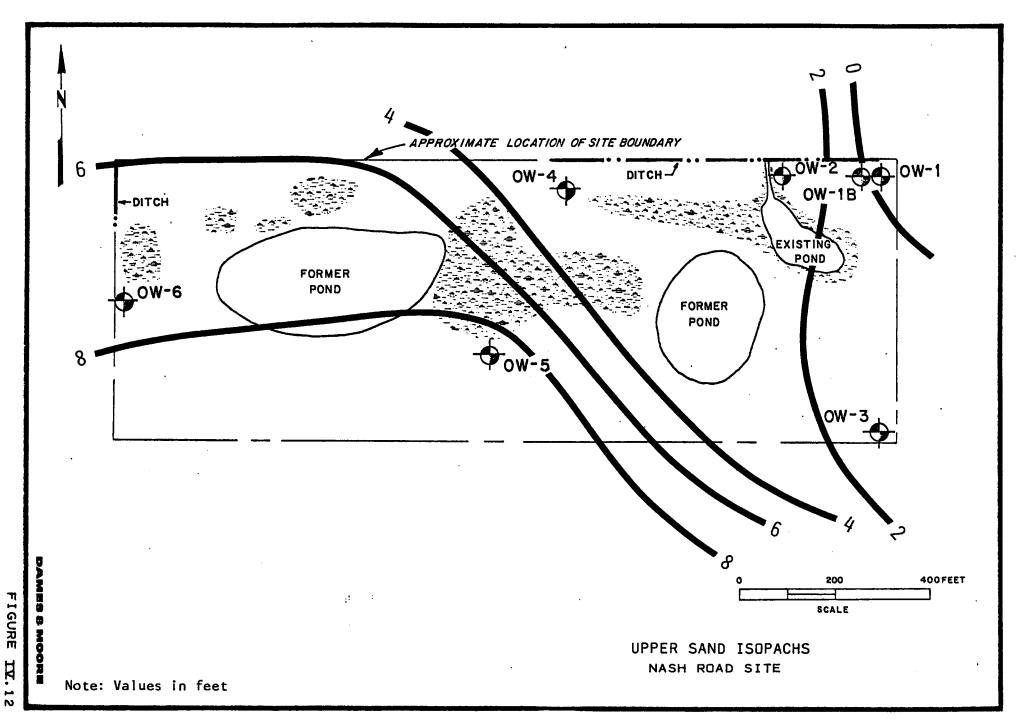
DATE 7/25/84

APPROXIMATE LOCATION OF SITE BOUNDARY OW-2 OW-1 DITCH-EXISTING FORMER POND FORMER POND 200 400 FEET SCALE

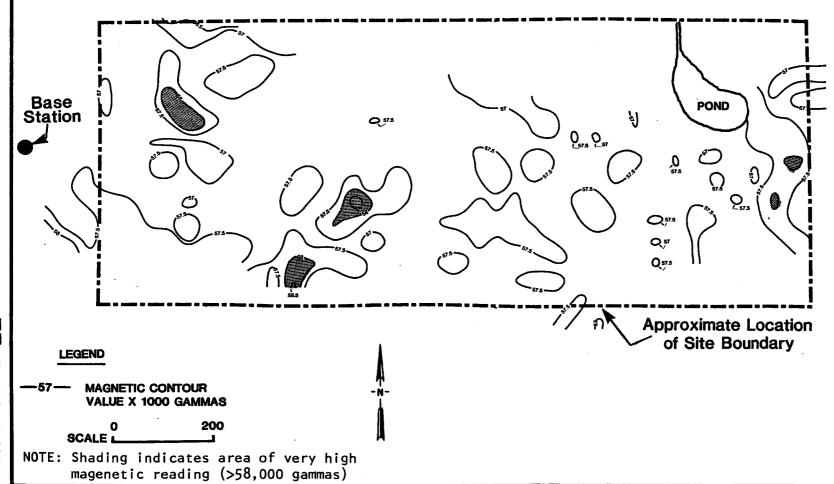
Note: Values in feet below arbitrary datum.

DEPTH TO TOP OF UPPER CLAY UNIT NASH ROAD SITE

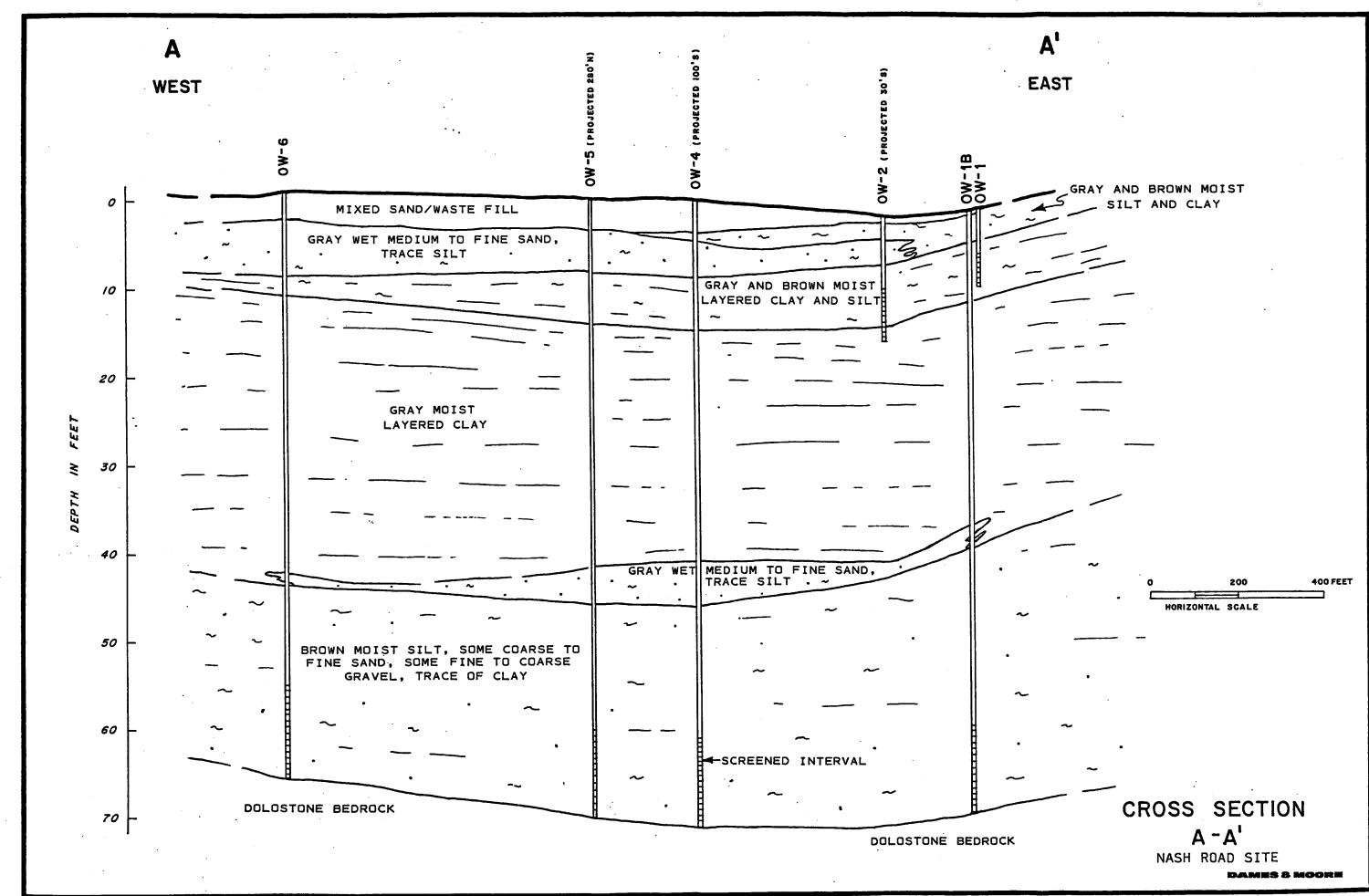
BY Q. Tomas DATE 7/25/84

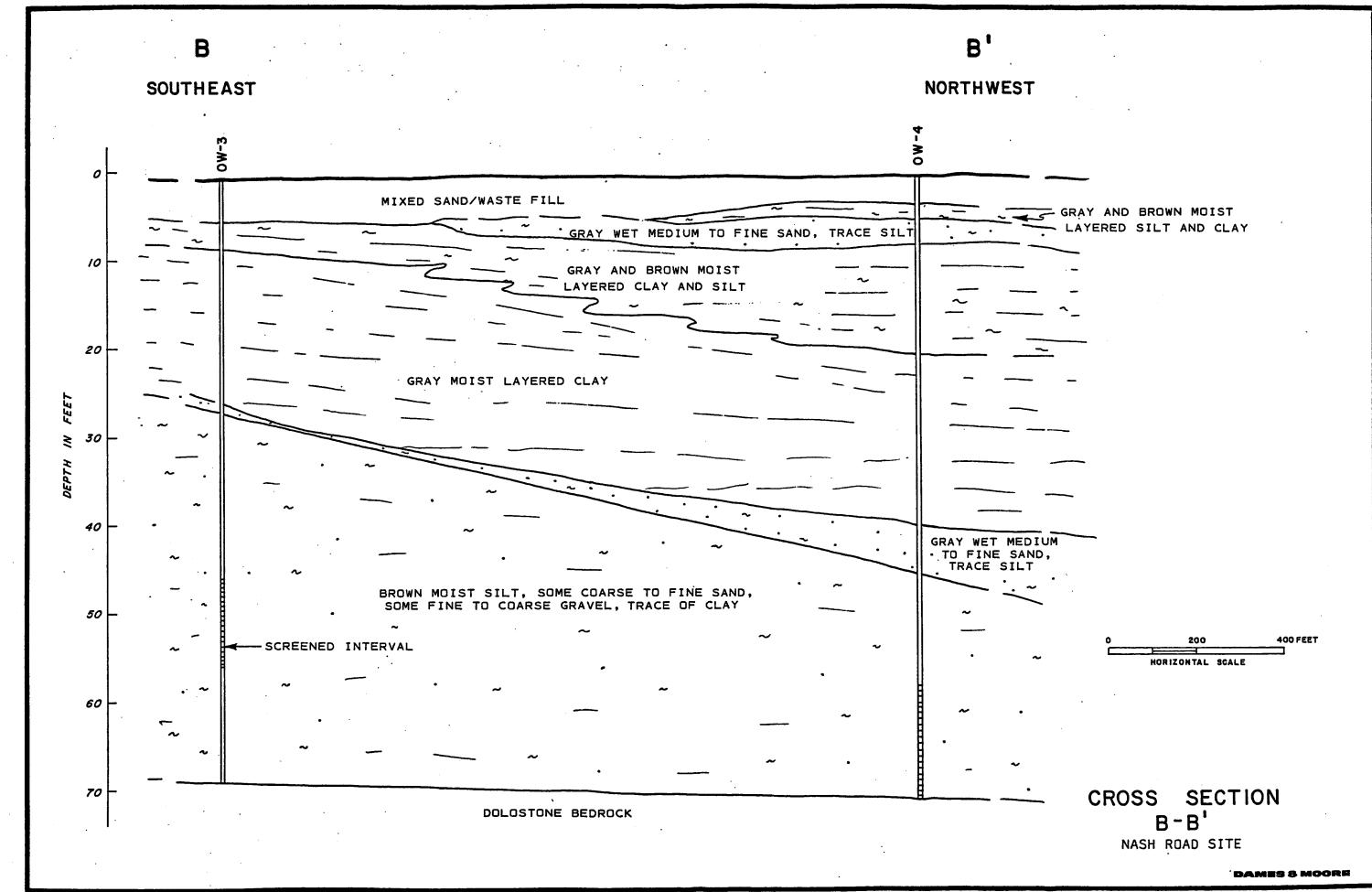


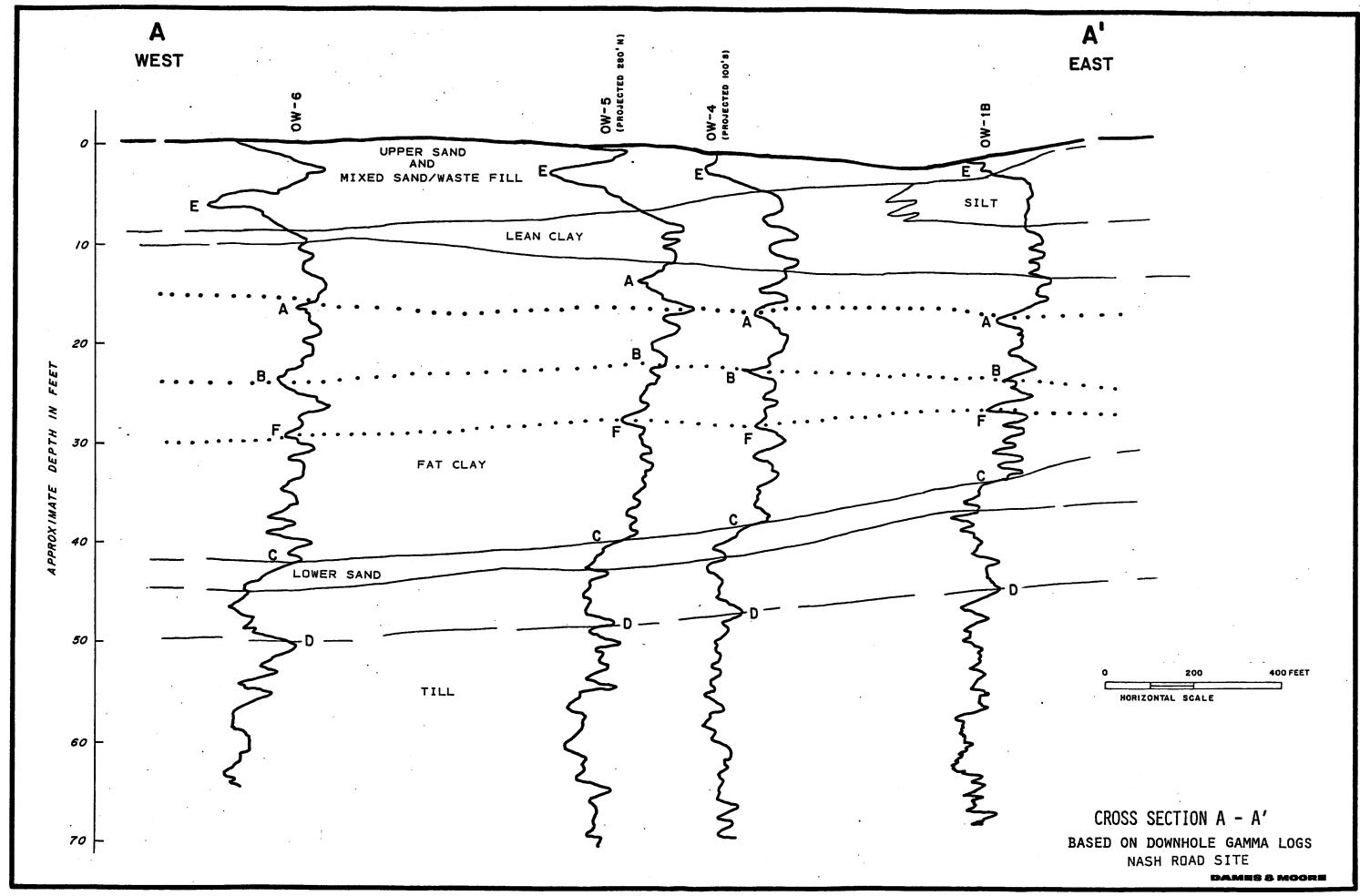
## **MAGNETIC CONTOUR MAP**

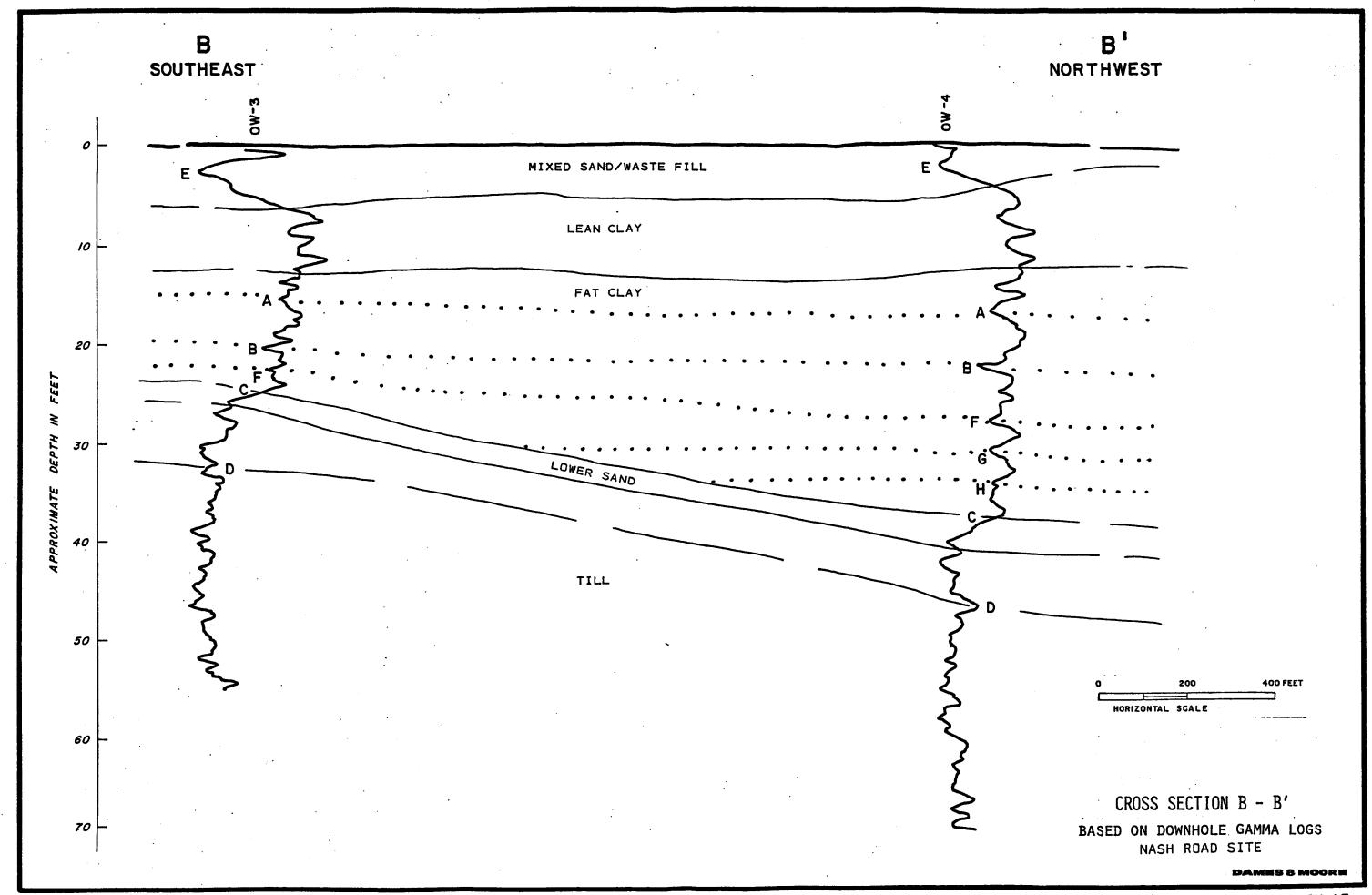


ES ENGINEERING-SCIENCE
FIGURE IV. 13

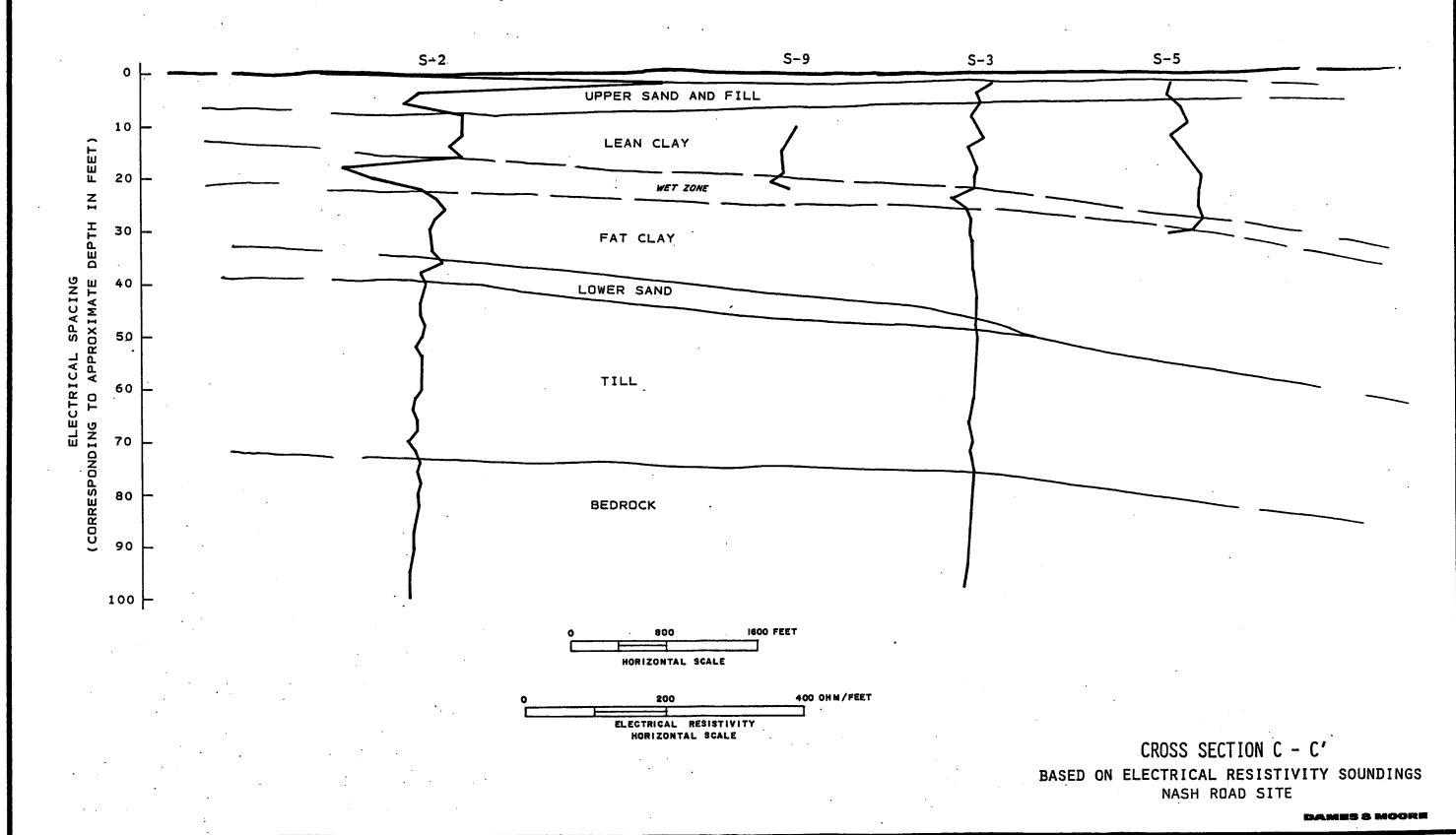












BY 0. Dance DATE 2/25/84

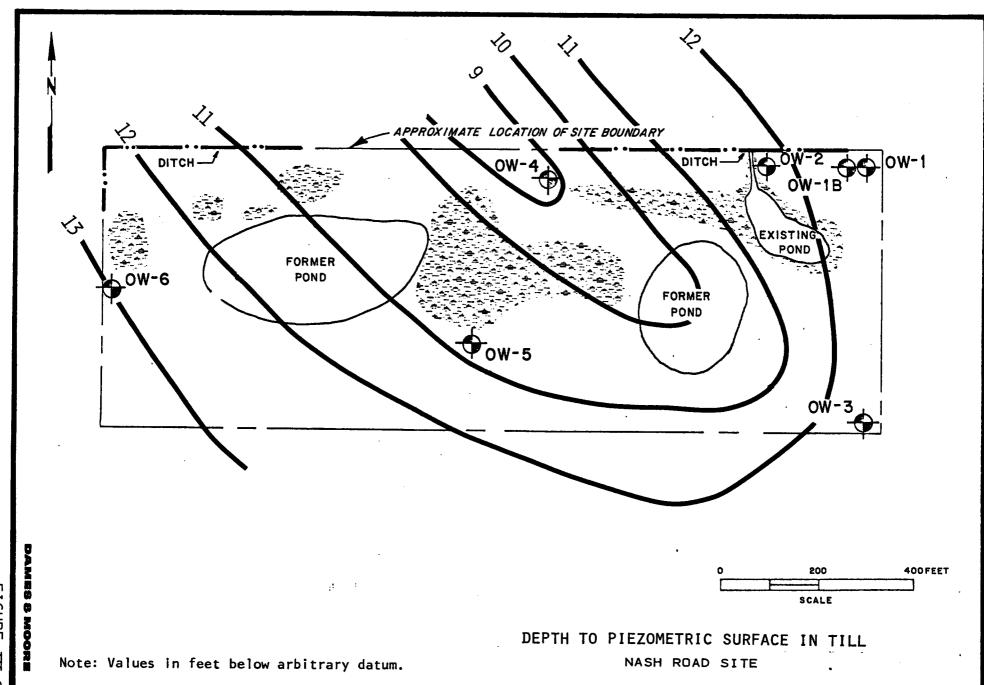
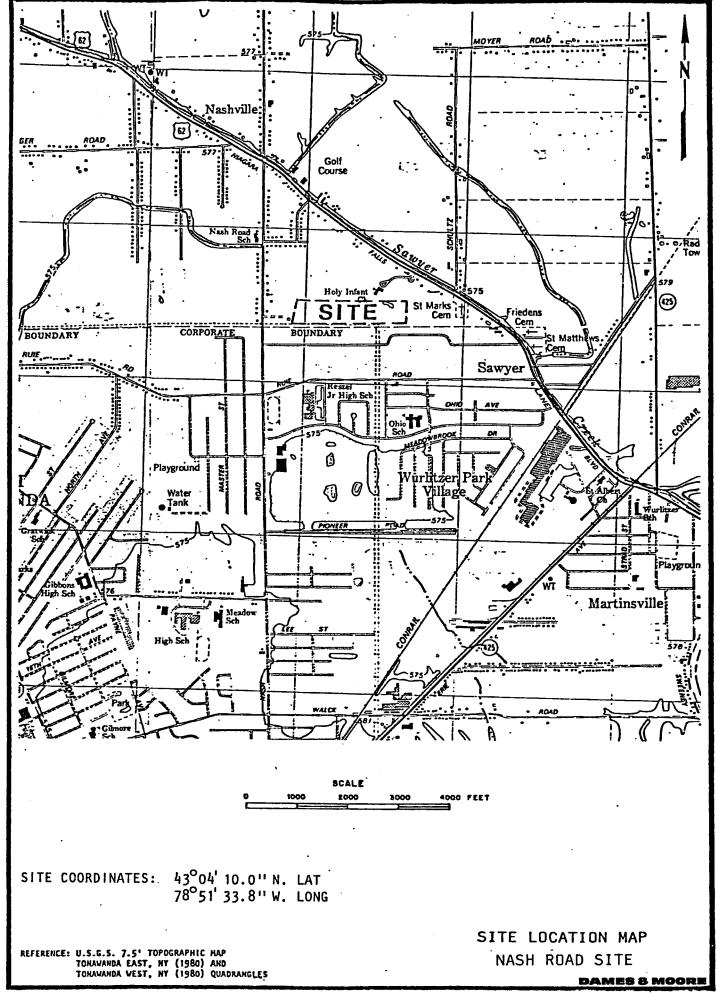


FIGURE IX. 20

FINAL HAZARD RANKING SYSTEM
for
Niagara Sanitation Landfill
Nash Road
Town of Wheatfield
Niagara County, New York State

The 25-acre site is an inactive landfill in the Town of Wheatfield, Niagara County (NYS) adjacent to the North Tonawanda City boundary. It is located in a suburban residential area, and is partly overgrown with trees and marsh vegetation. Nearby residents use the site as a jogging area, dirt bike track, and play area. The landfill was operated by Niagara Sanitation Company between 1964 and 1968. Both municipal and industrial wastes, including caustic materials and sludges, are disposed at the site. In addition, between 6/6/68 and 7/15/68, approximately 900 cubic yards of waste materials from the excavation of a sewer line at the Love Canal site were disposed in an excavated trench on this site (memo of 8/9/78 to Hennessy, NYSDOT).

Although some wastes are covered, protruding refuse is visible on the ground surface. For the Phase II study, several surface water, sediment and groundwater samples were chemically analyzed for a limited number of contaminants. Sediment was found to contain low levels of metals. No organic contaminants were found in the groundwater or surface water. A USGS (1982) investigation identified metal contamination in the shallow aquifer; current concern centers on the possible lack of containment of the waste and the migration of contaminants off-site. At the present time, no cleanup or enforcement actions are ongoing.



#### HRS COVER SHEET

Facility name:	NASH ROAD LANDFILL .
Location:	TOWN OF WHEATFIELD
EPA Region:	II
Person(s) in charge of the fac	ility:Ed Greinert
	Town Supervisor
	Town of Wheatfield, N.Y.
Name of Reviewer: Eileen Gilli	igan Date: 11/8/84
hazardous substances; location concern; types of information  Landfill used by Niagara  industrial wastes. Waste mate  Love Canal site disposed on the	ility: e impoundment, pile, container; types of n of the facility; contamination route of major needed for rating; agency action, etc.)  Sanitation 1964-1968 for both municipal and erials from the excavation of a sewer at the ne site in 1968. Improperly closed, rubbish organics found in soil and groundwater samples.
Scores: $S_{M} = 5.37 (S_{gw} = 5.65)$	5S = 7.38S = 0.0 )
S <sub>FE</sub> = 26.25	
$s_{DC} = 37.50$	

## HRS COVER SHEET

Facility Name: <u>Nash</u>	Road Landfill	vale	:11/8	/84				
Surface Water Route Work Sheet								
Rating Factor	Assigned Value (Circle One)	Multi- plier	Score	Max. Score	Ref. (Section)			
1 Observed Release	<b>6</b> 45	1	o O	45	4.1			
If observed release is	s given a value of s given a value of	45, proceed	ed to lin	e 4. 2. 🗸				
2 Route Characteristics					4.2			
Facility Slope and Intervening Terrain	0 1 2 3	1	0	3				
1-yr. 24-hr. Rainfal Distance to Nearest		1 2	2 6	3 6				
Surface Water Physical State	0 1 2 ③	1	3	3				
Total Route	Characteristics Sc	ore	11	15				
3 Containment	0 1 2 3	1	3	3	4.3			
4 Waste Characteristics					4.4			
Toxicity/Persistence	0 3 6 9 12 15	18 1	18	18				
Hazardous Waste Quantity	0123456	) 7 8 1	6	8	<b>.</b>			
Total Waste	Characteristics S	core	24	26				
5 Targets					4.5			
Surface Water Use Distance to a Sensi	0 1 (2) 3 tive (0) 1 2 3	` 3 2	6 0	9 6				
Environment Population Served/ Distance to Water Intake Downstream	① 4 6 8 1 12 16 18 20	0 <b>1</b>	0	40	_			
Total	Targets Score		6	55				
6   If line 1   is 45, m	ultiply 1 × 4 ltiply 2 × 3 >	× 5 × 4 × 5	4752	64,350				
7 Divide line 6 by 6				7.38				

Date: 11/8/84

Facility Name: Nash Road Landfill Date: 11/8/84								
Ground Water Route Work Sheet								
Rating Factor	Assigned (Circle		Multi- plier	Score	Max. Score	Ref. (Section)		
1 Observed Release	0	45)	1	45	45	3.1		
If observed release is	given a s	core of	45, proced	ed to lin	ne 4. 🗸			
2 Route Characteristics Depth to Aquifer of	0 1 2	2 3	2		6	3.2		
Concern Net Precipitation Permeability of the Unsaturated Zone	0 1 2 0 1 2	2 3 2 3	1 1		3			
Physical State		2 3	1		3			
Total Route	Characteri	istics So	ore		15			
3 Containment	0 1 2	2 3	1		3	3.3		
4 Waste Characteristics						3.4		
Toxicity/Persistence Hazardous Waste Quantity	0 3 6 9	9 12 15 ( 3 4 56)	18) 1 7 8 1	18 6	18 8			
Total Waste	Characteri	stics Sc	ore	24	26			
5 Targets						3.5		
Ground Water Use Distance to Nearest Well/Population Served	0 1 0 4 12 16 1 24 30 3			3 0	9 40	<del>-1</del>		
Total T	argets Sco	re		3	49	ļ		
6 If line 1 is 45, mu  If line 1 is 0, mu				3240	57,330			
7 Divide line 6 by 57				s <sub>gw</sub> =	5.65			

Date: <u>11/8/84</u>

# GROUND WATER ROUTE WORK SHEET

Facility Name: Nash F	Road Landfill	Date:	8/13/84		<del></del>			
Air Route Work Sheet								
Rating Factor	Assigned Value (Circle One)	Multi- plier	Score	Max. Score	Ref. (Section)			
1 Observed Release	<u>0</u> 45	1	0	45	5.1			
Date and Location:	July 1984 Air Quality S	urvey						
Sampling Protocol: 1	HNU survey							
If line 1 is 0, the If line 1 is 45, the	S = 0. Enter on line n proceed to line 2	5 . <b>√</b> ·						
2 Waste Characteristics					5.2			
Reactivity and	0 1 2 3	1	•	3				
Incompatibility Toxicity Hazardous Waste	0 1 2 3 0 1 2 3 4 5 6 7 8	3 1		9				
. Total Wast	e Characteristics Scor	е		20				
3 Targets					5.3			
Population Within	0 9 12 15 18	1		30				
4-Mile Radius Distance to Sensitive	21 24 27 30 e 0 1 2 3	2		6				
Environment Land Use	0 1 2 3	1		3				
Total Ta	rgets Score			39				
4 Multiply 1 x 2 x	3			35,100				
5 Divide line 4 by 35	,100 and multiply by 10	00	s <sub>a</sub> = 0					

8/13/84

## AIR ROUTE WORK SHEET

Facility Name: Nash Ro	oad Landfill	_ Date:_	8/13/	84			
Direct Contact Work Sheet							
Rating Factor	Assigned Value (Circle One)	Multi- plier	Score	Max. Score	Ref. (Section)		
1 Observed Incident	<u> </u>	1	0	45	8.1		
If line 1 is 45, pro	oceed to line 4	•					
2 Accessibility	0 1 2 3	1	3	3	8.2		
3 Containment	0 (15)	1	15		8.3		
Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4		
5 Targets					8.5		
Population Within	0 1 2 (3) 4	5 4	12	20			
1-Mile Radius Distance to a Critical Habitat	(i) 1 2 3	4	0	12			
					-		
Total	Targets Score		12 .	32			
6 If line 1 is 45, m	ultiply [] x [4]	x [5]					
If line [] is 45, mu	Itiply 2 × 3 ×	4 × 5	8100	21,600			
7 Divide line 6 by 2				= 37.50			

# DIRECT CONTACT WORK SHEET

Date: 8/13/84 Facility Name: Nash Road Landfill Fire and Explosion Work Sheet Ref. Assigned Value Multi-Max. Score Rating Factor (Section) Score (Circle One) plier 7.1 (3) 1 3 3 Containment 2 7.2 Waste Characteristics 3 0 Direct Evidence 3 3 Ignitability 0 3 Reactivity 0 2 Incompatibility 0 1 2 3 4 5 (6)7 8 Hazardous Waste Quantity Total Waste Characteristics Score 20 3 Targets 7.3 3 5 Distance to Nearest Population 1 Distance to Nearest Building 3 0 Distance to Sensitive Environment 2 Land Use Population Within 2-Mile Radius 5 Buildings Within 2-Mile Radius 14 24 Total Targets Score 4 Multiply  $1 \times 2 \times 3$ 378 1,440 5 Divide line 4 by 1,440 and multiply by 100 26.25 S<sub>FE</sub> =

## FIRE AND EXPLOSION WORK SHEET

Facility	Name:	Nash Road Landfill	Date:	11/8/84
racility	Name:	Masii Modd Halldtitt	Date	

#### Worksheet for Computing $S_{M}$

	S	s <sup>2</sup>
Groundwater Route Score (S <sub>gw</sub> )	5.65	31.92
Surface Water Route Score (S <sub>sw</sub> )	7.38	54.53
Air Route Score (S <sub>a</sub> )	0.0	0.0
$s_{gw}^2 + s_{sw}^2 + s_a^2$		86.45
$s_{gw}^2 + s_{sw}^2 + s_a^2$		.9.30
$\sqrt{s_{gw}^2 + s_{sw}^2 + s_a^2} / 1.73 = s_M =$		5.37

## WORK SHEET FOR COMPUTING SM

#### HRS DOCUMENTATION RECORDS

- 1) HAZARD RANKING SYSTEM
- 2) HNU PHOTO-IONIZER READING
- 3) OSTERMAN WELL
- 4) TRIP BLANKS
- 5) SEDIMENT DATA
- 6) GROUNDWATER DATA
- 7) SURFACE WATER DATA
- 8) BORING LOGS
- 9) SAMPLING LOCATION MAP
- 10) PERMEABILITY TEST DATA
- 11) BACKGROUND INFORMATION

1) HAZARD RANKING SYSTEM

#### DOCUMENTATION RECORDS FOR HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME:	Nash	Road	Landf	i11					
LOCATION:	Nash	Road	Town	of	Wheatfield,	Niagara	Co.,	New	York

#### GROUND WATER ROUTE

#### 1. OBSERVED RELEASE

Contaminants detected (5 maximum):

lead

total halogenated organics

nickel

arsenic

phenol

Rationale for attributing the contaminants to the facility:

groundwater sample from USGS study (1982)

t \* \*

#### 2. ROUTE CHARACTERISTICS

#### Depth to Aquifer of Concern

Name/description of aquifer(s) in concern:

- shallow aquifer in upper (surface) sand unit
- 2) low aquifer at till/bedrock interface: (Engineering Science/Dames & Moore soil borings)

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

- 1) approximately 0 feet
- 2) approximately 8 feet

(ES/D&M soil borings and field investigations)
Depth from the ground surface to the lowest point of waste disposal/
storage:

- 27 feet in disposal trench
- (New York State Department of Transportation memorandum of August 9, 1978)
- (Niagara County Department of Health memorandum from M. Hopkins, January 27, 1984)

#### Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

. 40"

(Federal Register, Volume 47 no. 137, Friday, July 16, 1982)

Mean annual lake or seasonal evaporation (list months for seasonal):

27"

(Federal Register, Volume 47 no. 137, Friday, July 16, 1982)

Net precipitation (subtract the above figures):

$$40" - 27" = 13"$$

#### Permeability of Unsaturated Zone

Soil type in unsaturated zone:

In western part of site, surface soil is a fine to medium sand. In eastern part of site, surface soil is clayey silt with trace of fine sand.

Permeability associated with soil type:

- 1) western part: 10-3 cm/sec (Lambe & Whitman)
- 2) eastern part:  $5 \times 10^{-4}$  cm/sec (in-situ test)

#### Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

solids

liquids in drums

(Dames & Moore site visit) (Memo of August 9, 1978)

#### 3 CONTAINMENT

#### Containment

Method(s) of waste or leachate containment evaluated:

drums and uncontained wastes

Method with highest score:

drums

#### 4 WASTE CHARACTERISTICS

#### Toxicity and Persistence

Compound(s) evaluated:

phenol
lead
nickel
arsenic (USGS study of 1982)
Compound with highest score:

chlorotoluenes benzoyl chloride benzoic acid (Hooker letter of May 9, 1968)

1ead (3,3) → 18

#### Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

900 cubic yards of chemical waste from Love Canal plus unknown quantity of other industrial waste

Basis of estimating and/or computing waste quantity:

DOT memo of August 9, 1978

#### 5 TARGETS

#### Ground Water Use

Uses(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Available for industrial use

(Discussion with M. Hopkins, Niagara Co. Dept. of Health, 1983)

#### Distance to Nearest Well

Location of nearest well drawing from <u>aquifer of concern</u> or occupied building not served by a public water <u>supply</u>:

Osterman residential well at 7403 Nash Road (presently unused but useable)

Distance to above well or building:

1,000 feet west of site

(USGS Topographic map; Tonawanda East, NY quadrangle)

#### Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

None.

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

Not applicable.

Total population served by ground water within a 3-mile radius:

0

#### SURFACE WATER ROUTE

#### 1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

TOX

methylene chloride

(Very low levels (11 ppb) may be indicative of background levels)

Rationale for attributing the contaminants to the facility:

Analysis of surface water samples in June, 1983 by Engineering Science/

\* \* \*

#### 2 ROUTE CHARACTERISTICS

#### Facility Slope and Intervening Terrain

Average slope of facility in percent:

۸۹

(USGS topographic map; Tonawanda East, NY)
Name/description of nearest downslope surface water:

Sawyer Creek (USGS topographic mapl Tonawanda East, NY)

Average slope of terrain between facility and above-cited surface water body in percent:

<1%

(USGS topographic map; Tonawanda East, NY)

Is the facility located either totally or partially in surface water?

Yes. Wastes in swamp areas and in water-filled disposal trenches.

Is the facility completely surrounded by areas of higher elevation?

No. (USGS topographic map; Tonawanda East, NY)

#### 1-Year 24-Hour Rainfall in Inches

2.1"
(Federal Register vol. 47, no. 137, Friday, July 16, 1982)

#### Distance to Nearest Downslope Surface Water

0.25 miles (USGS topographic map; Tonawanda East, NY)

#### Physical State of Wastes

liquid and solid (Dames & Moore site visit memo of 8/9/78)

3 CONTAINMENT

#### Containment

Method(s) of waste or leachate containment evaluated:

drums and uncontained (NYSDEC memo of August 9, 1978)

Method with the highest score:

drums

#### 4 WASTE CHARACTERISTICS

#### Toxicity and Persistence

#### Compound(s) evaluated:

phenol lead iron nickel (USGS study - 1982) chlorotoluenes benzoyl chloride benzoic acid (Hooker letter of May 9, 1968)

Compound with the highest score:

lead (3,3) → 18

#### Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of O (Give a reasonable estimate even if quantity is above maximum):

900 cubic yards of chemical waste from Love Canal and unknown quantity of other industrial waste

Basis of estimating and/or computing waste quantity:

NYSDOT memo of August 9, 1978

\* \* \*

#### 5 TARGETS

#### Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

recreation transportation (numerous ES/D&M site visits) Is there tidal influence?

No.

Distance to a Sensitive Environment (Ref: USGS topographic map)

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

none within 2 miles.

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

None within 1 mile.

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

None within 1 mile.
(Conversation with G. Batcheller, NYSDEC, Region 9)

#### Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

None.

(USGS topographic map; Tonawanda East, NY)

Computation of land area by above-cited intake(s) and conversion to population (1.5 people per acre):

Not applicable.

Total population served:

٥.

Name/description of nearest of above water bodies:

Not applicable.

Distance to above-cited intakes, measured in stream miles:

Not applicable.

#### AIR ROUTE

#### 1 OBSERVED RELEASE

Contaminants detected:

None detected with HNU meter during air survey of site by Dames & Moore in July, 1984.

Date and location of detection of contaminants

Not applicable.

Methods used to detect the contaminants:
Not applicable.

Rationale for attributing the contaminants to the site:

Not applicable.

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Not applicable.

Most incompatible pair of compounds:

Not applicable.

#### Toxicity

Most toxic compound:

Not applicable.

#### Hazardous Waste Quantity

Total quantity of hazardous waste:

Not applicable.

Basis of estimating and/or computing waste quantity:

Not applicable.

3 TARGETS

#### Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi

0 to 1 mi

0 to 1/2 mi

0 to 1/4 mi

Approximately 1,800 people (estimate from USGS topographic map)

#### Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

None within 2 miles. (USGS topographic map)

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

None within 1 mile. (USGS topographic map)

Distance to critical habitat of an endangered species, if 1 mile or less:

None within 1 mile.
(Conversation with G. Batcheller of NYSDEC, Region 9)

Land Use (Ref: Numberous site visits by ES/D&M personnel)

Distance to commercial/industrial area, if 1 mile or less:

0.01 mile (adjacent to National Fuel Gas installation)

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

None within 2 miles.

Distance to residential area, if 2 miles or less:

0.01 mile (adjacent to suburban area)

Distance to agricultural land in production within past 5 years, if 1 mile or less:

0.01 mile (adjacent to corn field)

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

None within 2 miles.

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within view of the site?

No.

2) HNU PHOTO-IONIZER READING

13305-003-19 7/10/84 4 ppm /cm 2"= 1 HR

3) OSTERMAN WELL

# COMPUCHEM LABORATORIES

August 30, 1984

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

Dear Mr. Schroder:

Thank you for selecting CompuChem® Laboratories for your recent sample analysis. We have completed the analysis that you requested and have enclosed a summary of the CompuChem® data for your review. Additional data details are available for purchase if you require them.

As you know, EPA has proposed detection limits for the priority pollutants in the December 3, 1979, Federal Register, and we have reported all priority pollutant concentrations which have exceeded these limits (or their equivalent for solid matrices). In addition, we have permanently stored a complete record of your data on magnetic tape. This includes chromatograms, mass spectra, calibration and quality control data for the organics. Therefore, your original data is readily available for future reference. Should you require additional information from your data base, please contact us at 1/800-334-8525.

In order to expedite data to you, we have forwarded the results for all completed analyses. If you submitted more samples than are included in the enclosed results, the data will be forthcoming upon completion of our final review.

Your confidence in our CompuChem® service is appreciated. We look forward to a continuing association.

Sincerely,

Customer Service Dept. CompuChem®

Enclosure:

Report: 0ST-1 - 32303

#### DATA REPORT NOTICE

CompuChem employs Methods 624 and 625 for GC/MS analysis of organics in liquid matrices. These methods were proposed on December 3, 1979 by the U.S.E.P.A. in Volume 44 of the Federal Register. These methods were subsequently revised and reissued in July, 1982 as publication EPA-600/4-82-057. The EPA Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) has subsequently issued method modifications which provide for the analysis of solid matrices. These modifications specify changes in the sample preparation procedures.

Additionally, for solid samples detection limits and any analytical results reported are based on processing the method specified sample size of as-received material.

The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic pollutant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

CompuChem® presents these compounds in its sample data report for completeness as many of the government compound list forms continue to display the affected compounds. For consistency, these compounds are reported as "BDL" or "Below Detection Limit" as they are either not likely to exist in the sample or are not likely to be detected by the method. Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	<u>Federal Register</u>	Date
Dichlorodifluoromethane	Volatile	46FR2264	1/8/81
*Trichlorofluoromethane	Volatile	46FR2264	1/8/81
Bis(Chloromethyl)Ether	Volatile	46FR10723	2/4/81

<sup>\*</sup>While this compound has been deleted, CompuChem® continues to identify and quantitate for it.

#### REPORT OF DATA

SAMPLE IDENTIFIER: OST-1

COMPUCHEM SAMPLE NUMBER: 32303

#### SUBMITTED TO:

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

DIANA A. SCAMMELL
TECHNICAL SPECIALIST, OPERATIONS

R. L. MYERS, PH.D., PRESIDENT

ROBERT E. MEIERER
DIRECTOR OF QUALITY ASSURANCE

# LABORATORY CHRONICLE

# SAMPLE IDENTIFIER: OST-1 COMPUCHEM SAMPLE NUMBER: 32303

:			•	<u>Date</u>
Recei	ved/Ref	rigerated	•	7-27-84
Organ	ics		•	
١	Extract	ed		7-30-84
	Analyze	d		
•	1.	Volatiles		7-31-84
2	2.	Acid		8-8-84
€ je je Sta	3.	Base/Neutrals		8-7-84
	4.	Pesticides/PCBS		8-7-84
Inorga	anics			
	1.	Metals		8-14-84
	2.	Cyanide		8-9-84
:	<b>3.</b> '	Phenols		Not Requested

#### OMPOUND LIST - VOLATILES ORGANICS

SAMPLE IDENTIFIER: OST-1 COMPUCHEM SAMPLE NUMBER: 32303

AMERICAN STREET		•		DETEC	TAULT
			CONCENTRAT	ON LIMI	T
			(UG/L)	(UG/L	.) .
	•	•			
1V. CHLOROMETHANE		•	. BDL	10	Ì
_ , _ ,			BDL	. 10	
2V. VINYL CHLORIDE	•		BDL	10	
3V. CHLOROETHANE	A Company		BDL	10	
4V. BROMOMETHANE			BDL	100	
5V. ACROLEIN		•		100	
6V. ACRYLONITRILE			BDL		
7V. METHYLENE CHLO			14(BG)*	10	
8V. TRICHLOROFLUOR			BDL	10	
9V. 1,1-DICHLOROET			BDL	10	
10V. 1,1-DICHLOROET	'HANE		BDL	10	
11V. TRANS-1,2-DICH	LOROETHYLENE		BDL	10	
12V. CHLOROFORM			BDL	10	
13V. 1,2-DICHLOROET		1	BDL	10	
14V. 1,1,1-TRICHLOR	OETHANE	•	BDL	10	
15V. CARBON TETRACH	LORIDE		BDL	10	
16V. BROMODICHLOROM	IETHANE		BDL	. 10	
17V. 1,2-DICHLOROPR	OPANE		BDL	10	
18V. TRANS-1,3-DICH	LOROPROPENE		BDL	10	
19V. TRICHLOROETHYL	ENE C	,	BDL	10	
20V BENZENE		•	BDL.	10	
21V. CIS-1,3-DICHLO	ROPROPENE		BDL	10	٠.
22V. 1,1,2-TRICHLOR	OETHANE		BDL	. 10	
23V . DIBROMOCHLOROM	ETHANE		BDL	10	
24V BROMOFORM	,		BDL	10	· ,
25V. 1,1,2,2-TETRAC	HI OROFTHYLENE		BDL	10	
26V. 1,1,2,2-TETRAC	HI OROFTHANE		BDL	10	1
27V. TOLUENE			BDL	10	)
28V CHLOROBENZENE			BDL	10	
29V. ETHYLBENZENE			BDL	10	
30V. 2-CHLOROETHYL	VINVI ETHED		BDL	10	
	VINIL LINER	.*	BDL		•
31V. DICHLORODIFLUO	IVI TETUEDT		BDL		
32V BIS (CHLOROMETH	IIL)EINEK'	·	DDL .		:

# BDL=BELOW DETECTION LIMIT

<sup>†</sup>See Dața Report Notice

<sup>\*</sup>See Quality Control Notice

#### QUALITY ASSURANCE NOTICE

Although not required by the Federal Register, December 3, 1979 (modified July, 1982) Volatile Method 624 procedure, the laboratory prepares VOA blanks when compositing water samples and preparing low and medium level hazardous waste VOA samples. This is to insure that the glassware used is free from contamination, and to monitor the possibility of cross-contamination from high levels of volatile organic compounds in some samples and the laboratory atmosphere.

The compositing or method blank (# 32333 ) prepared with this sample contained the compound(s) listed below. The concentration in the associated sample has been adjusted and the data flagged with a qualifier.

Compound(s)	Adjusted Sample Concentration (ug/l)	•	Applicable Qualifier
Methylene Chloride	14	.•	BG

The following data qualifiers are used by EPA and adopted by CompuChem® for reporting purposes:

BG = The concentration in the blank is greater than ½ of the method detection limit and is less than or equal to ½ the concentration detected in a sample; the concentration in the blank is subtracted from the sample.

## COMPOUND LIST -- ACID EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: OST-1 COMPUCHEM SAMPLE NUMBER: 32303

CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
BDL	25
•	25
	250
· · · · · · · · · · · · · · · · · · ·	25
	250
BDL	25
	BDL

BDL=BELOW DETECTION LIMIT

#### COMPOUND LIST : -- BASE-NEUTRAL EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: OST-1
COMPUCHEM SAMPLE NUMBER: 32303

	CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B. N-NITROSODIMETHYLAMINE 2B. BIS (2-CHLOROETHYL) ETHER 3B. 1,3-DICHLOROBENZENE 4B. 1,4-DICHLOROBENZENE 5B. 1,2-DICHLOROBENZENE 6B. BIS (2-CHLOROISOPROPYL) ETHER 7B. HEXACHLOROETHANE 8B. N-NITROSODI-N-PROPYLAMINE	BDL BDL BDL BDL BDL BDL BDL BDL BDL	10 10 10 10 10 10 10
9B. NITROBENZENE  10B. ISOPHORONE  11B. BIS(2-CHLOROETHOXY) METHANE  12B. 1,2,4-TRICHLOROBENZENE  13B. NAPHTHALENE  14B. HEXACHLOROBUTADIENE  15B. HEXACHLOROCYCLOPENTADIENE	BDL BDL BDL BDL BDL BDL BDL BDL	10 10 10 10 10 10
16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE	BDL BDL BDL BDL BDL BDL	10 10 10 10 10 10
23B. FLUORENE 24B. 4-CHLOROPHENYL PHENYL ETHER 25B. DIPHENYLAMINE (N-NITROSO) 26B. 1,2-DIPHENYLHYDRAZINE (AZOBENZENE) 27B. 4-BROMOPHENYL PHENYL ETHER 28B. HEXACHLOROBENZENE	BDL BDL BDL BDL BDL BDL BDL	10 10 10 10 10 10

(Continued)

BDL=BELOW DETECTION LIMIT

SAMPLE IDENTIFIER: OST-1 COMPUCHEM SAMPLE NUMBER: 32303

	CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B. PHENANTHRENE	BDL	10
30B. ANTHRACENE	BDL	· 10
31B. DI-N-BUTYLPHTHALATE	BDL	10
32B. FLUORANTHENE	BDL	10
33B. BENZIDINE	BDL	10
34B. PYRENE	· BDL	10
35B. BUTYLBENZYLPHTHALATE	<b>33</b>	10
36B. BENZO(A)ANTHRACENE	BDL.	10
37B. 3.3'-DICHLOROBENZIDINE	BDL.	10
38B. CHRYSENE	BDL	10
39B. BIS(2-ETHYLHEXYL)PHTHALATE	BDL.	10
40B DI-N-OCTYLPHTHALATE	BDL	. 10
41B. BENZO(B)FLUORANTHENE	BDL	10
42B. BENZO(K)FLUORANTHENE	BDL	10
43B. BENZO(A)PYRENE	BDL	10
44B. INDENO(1,2,3-C,D)PYRENE	BDL	25
45B. DIBENZO(Á,H)ANTHRACENE	BDL	25
46B. BENZO(G,H,I)PERYLENE	BDL.	25

### COMPOUND LIST -- PESTICIDES/PCB'S

DETECTION

SAMPLE IDENTIFIER: 0ST-1
COMPUCHEM SAMPLE NUMBER: 32303

		CONCENTRATION (UG/L)	LIMIT (UG/L)
1 D	ALDRIN	BDL.	10
3D .	ALPHA-BHC	BDL.	. 10
2P.,	BETA-BHC	BDL	10
3P. i.	GAMMA-BHC	BDL	10
4P.		BDL	10
5P.	DELTA-BHC	BDL	10
6P •	CHLORDANE	BDL	- 10
7P.	4,4'-DDT	BDL	10
8P.	4,4'-DDE	BDL	10
9P		BDL	10
10P.	DIELDRIN	BDL	10
11P.	ALPHA-ENDOSULFAN	BDL	10
12P.	BETA-ENDOSULFAN	BDL	10
13P.	ENDOSULFAN SULFATE	BDL	10 .
14P.	ENDRIN	BDL	10
15P.	ENDRIN ALDEHYDE	BDL	10
16P.	HEPTACHLOR	BDL	10
17P.:		BDL BDL	10
18P.		BDL	10
19P.		· · · · · · · · · · · · · · · · · · ·	10
20P.		BDL	10
21P.	PCB-1232	BDL	
22P.	PCB-1248	BDL	10
23P.	PCB-1260	BDL	10
24P.	PCB-1016	BDL	10
25P.	· · · · · · · · · · · · · · · · · · ·	BDL	10

#### COMPOUND LIST -- INORGANICS PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: OST-1
OMPUCHEM SAMPLE NUMBER: 32303

			CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)	
	3		(PIG/L)	(Md/L)	
	CADMIUM, TOTAL		BDL	0.010	
3.	CHROMIUM, TOTA COPPER, TOTAL	lle de la company de la compan	BDL BDL	0.050	
5.	LEAD, TOTAL * MERCURY, TOTAL		0.14	(0.50)	RMP
6.	ZINC, TOTAL NICKEL, TOTAL		0.05 BDL	0.020 0.10	
	CYANIDÉ		BDL	0.01	
					A PART
149			, , , <b>,</b> ,	05	
, ,				00	

### BDL=BELOW DETECTION LIMIT

\*Lead analyzed by flame AAS because of concentration level found.



Send copy to
Gilligan, DEM
File
Rocco

NOV 19 1984

November 8, 1984

Mr. Rocco Palazzolo
Engineering Science, Inc.
57 Executive Park South
Suite 590

RE: Data Inquiry for sample OST-1/32303

Dear Mr. Palazzolo:

Enclosed is an amended compound list for sample number 32303 that reflects the correct detection limit for lead.

We apologize for any inconvenience you may have experienced. If you have further questions please feel free to call me at 1/800-334-8525.

Sincerely,

Diana A. Scammell

Technical Specialist, Operations

cc: Robert Meierer

Mickey Cartagena

File #32303

#### COMPOUND LIST -- INORGANICS PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: OST-1 COMPUCHEM SAMPLE NUMBER: 32303

			(MG/L)	(MG/L)
		• •		
1.	CADMIUM, TOTAL		BDL.	0.010
2.	CHROMIUM, TOTAL		BDL	0.050
	COPPER, TOTAL	•	BDL.	0.10
	LEAD, TOTAL*	•	0.14	0.050
	MERCURY, TOTAL		0.0008	0.00020
	ZINC, TOTAL	•	0.05	0.020
	NICKEL, TOTAL		BDL	0.10
	CYANIDE		BDL	0.010

BDL=BELOW DETECTION LIMIT \*Lead analyzed by flame AAS because of concentration level found.



#### RONMENTAL LABORATORIES

Division of Recra Research, Inc.

1st sample of Gill Creek Solv. Chen 1st sample of Osterman Welf North

H<sub>2</sub>M PRIORITY POLLUTANT ANALYSES

Prepared For:

H2M 575 Broadhallow Road Melville, NY 11747

Prepared By: ...

Recra Environmental Laboratories 4248 Ridge Lea Road Amherst, NY 14226

Report Date: October 3, 1984

#### H2M PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

#### INTRODUCTION:

On September 5, 1984 samples were received at Recra Environmental Laboratories. A request was made by H2M to have the samples analyzed for selected fractions of the Environmental Protection Agency decreed priority pollutants.

This report will address the results of those analyses.

#### METHODS:

Priority pollutant analyses were conducted according to Environmental Protection Agency (EPA) methodologies.

Organic priority pollutants were analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). Pesticide priority pollutants were analyzed by Gas Chromatography.

#### RESULTS AND DISCUSSION:

No Volatile field blank was received.

retention times between samples and standards on a single gas chromatographic column. Gas chromatographic values reported as "less than" (<) indicate the working detection limit for the given sample and/or parameter.

Pesticides identified by Gas Chromatography are at concentrations too low for confirmation via Gas Chromatography/Mass Spectrometry.

Compounds reported as ND are "not detected".

Respectfully Submitted,

RECRA ENVIRONMENTAL LABORATORIES

Barbara J Krajewsku



# CHROMATOGRAPHY/MASS SPECTROMET PRIORITY POLLUTANT ANALYSES

· 持續的 · 第二人		SAMPLE IDENTIFICATION		
COMPOUND -	DETECTION LIMIT. (ug/l)	GILL CREEK	OSTERMAN PROPERTY	
2-chlorophenol	3.3	ND	ND	
2,4-dichlorophenol	2.7	ND ND	ND :	
2,4-dimethylphenol	2.7	ND	ND	
4,6-dinitro-o-cresol	24	ND	ND	
2,4-dinitrophenol	42	ND	ND	
2-nitrophenol	3.6	ND	ND	
4-nitrophenol	2.4	ND	ND	
p-chloro-m-cresol	3.0	ND	ND	
pentachlorophenol	3.6	ND	ND :	
phenol '	1.5	ND	ND 14 S A	
2,4,6-trichlorophenol	2.7	ND	ND	

ADDITIONAL SAME LE INFORMATION		
Sample Date	7/11/84	7/11/84
Extraction Date	9/7/84	9/7/84
Analysis Date	9/19/84	9/19/84
Internal Standard (IS) - Level	20 μg/l	20 μg/1
deuterated phenanthrene - Recovery	100%	110%
Surrogate Standard (SS1) - Level	120 µg/1	120 µg/1
2-fluorophenol - Recovery	55%	30%
Surrogate Standard (SS2) Level	120 µg/1	120 μg/1
pentafluorophenol - Recovery	43%	27%

## H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

BASE/	NEUTR	ALS
	ILTO TV	21111

	DROLJ.	SAMPLE IDENTIFICATION		
COMPOUND	DETECTION LIMIT (ug/1)	GILL CREEK	OSTERMAN PROPERTY	
acenaphthene	1.9	ND .	ND	
acenaphthylene	3.5	ND	ND	
anthracene	1.9	ND ·	ND	
penzidine	44	ND ·	ND	
benzo(a)anthracene	7.8	NDND	ND ND	
penzo(a)pyrene	2.5	ND	ND	
benzo(b)fluoranthene	4.8	ND	ND ·	
penzo(g,h,i)perylene	4.1	ND	ND	
benzo(k)fluoranthene	2.5	ND	ND	
bis(2-chloroethoxy)methane	5.3	ND	ND	
bis(2-chloroethyl)ether	5.7	ND	ND	
bis(2-chloroisopropyl)ether	5.7	ND	ND	
ois(2-ethylhexyl)phthalate	2.5	ND	ND	
4-bromophenylphenylether	1.9	ND	ND	
•	2.5	ND	ND	
putylbenzylphthalate	1.9	ND	ND	
2-chloronaphthalene	4.2	ND	ND	
4-chlorophenylphenylether	2.5	ND	ND	
chrysene		ND ND	ND	
dibenzo(a,h)anthracene	2.5	ND ND	ND Specifical Control of the Control	
1,2-dichlorobenzene	1.9	ND ND	ND	
1,3-dichlorobenzene	1.9	•	ND	
1,4-dichlorobenzene	4.4	ND ND	ND	
3,3'-dichlorobenzidine	10.3	ND	ND ND	
diethylphthalate	22	ND		
dimethylphthalate	1.6	ND	ND	
di-n-butylphthalate	2.5	ND .	ND	

(Continued)



#### H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date:

	BASE/NE	BASE/NEUTRALS SAMPLE IDENTIFICATION		
COMPOUND	DETECTION LIMIT (µg/1)	GILL CREEK	OSTERMAN PROPERTY	
2,6-dinitrotoluene	1.9	ND	ND	
2,4-dinitrotoluene	5.7	ND	ND	
di-n-octylphthalate	2.5	ND	ND	
1,2-diphenylhydrazine	25	ND	ND	
fluoranthene	2.2	ND	ND	
fluorene	1.9	ND	ND	
hexachlorobenzene .	1.9	ND ·	ND	
hexachlorobutadiene	0.9	ND	ND	
hexachlorocyclopentadiene	25	ND	· ND	
hexachloroethane	1.6	ND	ND	
indeno(1,2,3-cd)pyrene ^	3.7	ND	ND	
isophorone	2.2	ND	, ND	
naphthalene	1,6	ND	· ND	
nitrobenzene	1.9	ND	ND	
N-nitrosodimethylamine	25	ND .	ND	
N-nitrosodi-n-propylamine	25	ND	ND	
N-nitrosodiphenylamine	1.9	ND .	ND	
phenanthrene	5.4	ND	ND	
pyrene	1.9	ND	ND	
1,2,4-trichlorobenzene	1.9	ND	ND	

ADDITIONAL SAMPLE INFORMATION

Sample Date	7/11/84	7/11/84
Extraction Date	9/7/84	9/7/84
Analysis Date	9/19/84	9/19/84
Internal Standard - Level	20 ug/1	20 ug/1
deuterated phenanthrene - Recovery	100%	110%
Surrogate Standard (SS3) - Level	120 ug/1	120 µg/1
decafluorobiphenyl - Recovery	55%	45%
Surrogate Standard (SS4) - Level	100 ug/1	100 µg/1
2-fluorobiphenyl - Recovery	60%	47% :

FOR RECRA ENVIRONMENTAL LABORATORIES Invais I Krajewski

ENVIRONMENTAL LABORATORIES

# H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

VOLATILES

and the stady of t		ATILES SAMPLE IDEN	TIFICATION
COMPOUND	DETECTION LIMIT (µg/1)	GILL CREEK	OSTERMAN PROPERTY
acrolein	400	ND	ND
acrylonitrile	400	ND	ND
benzene	4.4	ND	ND
bromodichloromethane	2.2	ND	ND ND
bromoform	4.7	ND	ND
bromomethane	10	ND	ND
carbon tetrachloride	2.8	ND	ND
chlorobenzene	6.0	ND	ND
chloroethane	10	ND	ND "
2-chloroethylvinyl ether	10	ND	ND
chloroform	1.6	ND	^ ND
chloromethane	10	ND	ND
dibromochloromethane	3.1	ND ·	ND
1,1-dichloroethane	4.7	ND	ND
1,2-dichloroethane	2.8	ND	ND 3
1,1-dichloroethylene	2.8	ND	ND
trans-1,2-dichloroethylene	1.6	ND	ND
1,2-dichloropropane	6.0	ND	ND
1,3-dichloropropene	5.0	ND	ND
ethylbenzene	7,2	ND	ND ND
methylene chloride	2.8	ND	ND NO
·1,1,2,2-tetrachloroethane	6.9	ND ,	ND
tetrachloroethylene	4.1	ND	ND

(Continued)



	VOI	TUTTIED	
		SAMPLE IDEN	TIFICATION
	DETECTION LIMIT	A STATE OF THE STA	
COMPOUND	(ug/1)	GILL CREEK	OSTERMAN PROPERTY
toluene	6.0	ND	ND
1,1,1-trichloroethane	3.8	ND	ND
1,1,2-trichloroethane	5.0	ND	ND
trichloroethylene	1.9	ND	ND
vinyl chloride	10	ND	ND
<u> </u>			1.0

ADDITIONAL SAMPLE INFORMATION

INDITIONING CHARGE INTOIGNITION		
Sample Date	7/11/84	7/11/84
Analysis Date	9/17/84	9/17/84
Internal Standard - Level	40 µg/l	40 μg/1
bromochloromethane - Recovery	73%	80%
Internal Standard - Level	40 µg/1	40 μg/1
2-bromo-1-chloropropane - Recovery	170%	73%
Internal Standard - Level	40 µg/1	40 μg/1
1,4-dichlorobutane - Recovery	76%	76%



RA ENVIRONMENTAL LABORATORIES I.D. #84-898

# H2M GAS CHROMATOGRAPHY PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

	PESTICIDES/PCB'S SAMPLE IDENTIFICATION (DATE)		
		SAMPLE IDENT	TETCALLON COALIN
19-1	UNITS OF	GILL CREEK (7/11/84)	OSTERMAN PROPERTY (7/11/84)
COMPOUND	MEASURE	0.10	<0.01
aldrin	ug/1	0.36	<0.01
α-ВНС	ug/1		<0.01
в-внс	пв/1	0.26	<0.01
δ-BHC	ug/l	0.05	<0.01
Y-BHC	ug/l	0.04	<0.1
	ug/1	<0.2	
chlordane	ug/1	<0.02	<0.01
4,4'-DDD		<0.02	<0.01
4,4'-DDE	ив/1	<0.02	<0.01
4,4'-DDT	ug/l	<0.02	<0.01
dieldrin	ug/1		<0.01
α-endosulfan	ug/1	<0.02	<0.01
8-endosulfan	ug/1	<0.02	<0.01
endosulfan sulfate	ug/1	<0.02	<0.01
	ug/l	<0.02	
endrin	ug/1	<0.02	<0.01
endrin aldehyde		<0.02	<0.01
heptachlor	μg/1	<0.02	<0.01
heptachlor epoxide	μg/1 ·	<0.2	<0.1
PCB-1016	ug/1		<0.2
PCB-1221	μg/1	<0.4	<0.2
	μ <b>g/1</b>	<0.4	
PCB-1232	μg/1	<0.2	<0.1
PCB-1242		<0.2	<0.1
PCB-1248	ug/1	<0.2	<0.1
PCB-1254	μg/1	<0.2	<0.1
PCB-1260	μg/1		<0.1
toxaphene	μg/1	<0.2	

	nece A	ENVIRONMENTAL	LABORATORIES	7. Boyele
FUK	KECKA	FIGURE	DATE	10/3/84



# H2M IORITY POLLUTANT ANALYSES

	•	METALS		
1	April 18 1	SAMPLE IDENTIFICATION (DATE)		
COMPOUND	UNITS OF MEASURE	• GILLCREEK (7/11/84)	OSTERMAN PROPERTY (7/11/84)	
Total antimony	mg/1	<0.005	<0.005	
Total arsenic	mg/1	<0.005	<0.005	
Total beryllium	mg/1	<0.005	<0.005	
Total cadmium	mg/l	0.007	. 0.006	
Total chromium	mg/l	<0.005	<0.005	
Total copper	mg/1	0.010	0.013	
Total lead	mg/1	<0.005	<0.005	
Total mercury	mg/1	0.003	<0.0005	
Total nickel	mg/l	<0.005	<0.005	
Total selenium	mg/1	<0.005	<0.005	
Total silver	mg/1	<0.02	<0.02	
Total thallium	mg/l	<0.005	<0.005	
Total zinc	mg/1	0.061	0.258	

LABORATORIES



# H2M PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

#### MISCELLANEOUS

		MISCEPTWHEOOS	
**************************************		SAMPLE IDENT	IFICATION (DATE)
COMPOUND	UNITS OF MEASURE	GILL CREEK (7/11/84)	OSTERMAN PROPERTY (7/11/84)
COMPOUND	MEASURE	(//11/04)	. (7/11/04)
1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	• •	•	
Total cyanide	mg/l	<0.010	<0.01
Total recoverable			
phenolics	mg/l	<0.01	<0.01

FOR RECRA ENVIRONMENTAL LABORATORIES DATE 10/3/84

# H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES QUALITY CONTROL

Report Date: 10/3/84

# EXTRACTABLE RECOVERY ANALYSIS OF SAMPLE GILL CREEK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	Z RECOVERY	
2-chlorophenol	. 50	43	86	
1,3-dichlorobenzene	50	29	58	
2,4-dichlorophenol	50 -	46	. 92	
di-n-octylphthalate .	50	29	58	
fluoranthene	50	50	100	
naphthalene	50	34	68	
nitrobenzene	50	36	72 ·	
2,4,6-trichlorophenol	50	29	58	

#### ADDITIONAL SAMPLE INFORMATION

Sample Date	7/11/84
Extraction Date	9/7/84
Analysis Date	9/19/84
Internal Standard (IS) - Level	20 μg/l
deuterated phenanthrene - Recovery	120%
Surrogate Standard (SS1) - Level	120 µg/1
2-fluorophenol - Recovery	36%
Surrogate Standard (SS2) - Level	120 µg/1
pentafluorophenol - Recovery	27%
Surrogate Standard (SS3) - Level	120 µg/l
decafluorobiphenyl - Recovery	46%
Surrogate Standard (SS4) - Level	100 ug/l
2-fluorobiphenyl - Recovery	52%

DATE

FOR RECRA ENVIRONMENTAL LABORATORIES

Brilace & frageworks

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RECRA ENVIRONMENTAL LABORATORIES

#### ANALYTICAL RESULTS

## H2M GAS CHROMATOGRAPHY PRIORITY POLLUTANT ANALYSES QUALITY CONTROL

Report Date: 10/3/84

### PESTICIDE RECOVERY ANALYSIS OF SAMPLE GILL CREEK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	RECOVERY
aldrin	0.26	0.20	77
ү-ВНС	0.24	0.19	79
4,4'-DDE	0.25	0.20	80 .
β-endosulfan	0.66	0.61	92
endrin	0.23	0.29	126
heptachlor	0.24	0.18	75

FOR RECRA ENVIRONMENTAL LABORATORIES L. Beyolc

DATE /0/3/84

4) TRIP BLANKS

SAMPLE IDENTIFIER: SD-1 Trip Blank COMPUCHEM SAMPLE NUMBER: 32302

	VOLATILE ORGANICS	CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)	SCAN NUMBER
17.	CHLOROMETHANE	BDL	10-	
27.		BDL	10	1
	CHLOROETHANE	BDL	- 10	
47.	BROMOMETHANE	BDL	10	
5Y.	ACROLEIN	BDL	100	
	ACRYLONITRILE	BDL	100	
77.		BDL	. 10	
87.	TRICHLOROFLUOROMETHANE	BDL	10	, A.
	1,1-DICHLOROETHYLENE	BDL	. 10	
107.	1,1-DICHLOROETHANE	BDL	10	8
117.	TRANS-1,2-DICHLOROETHYLENE	BDL	10	
127.	CHLOROFORM	BDL	10	
137.	1,2-DICHLOROETHANE	BDL	10	
144.	1,1,1-TRICHLOROETHANE	BDL	10	
	CARBON TETRACHLORIDE	BDL	10	
177	BROMODICHLOROMETHANE 1,2-DICHLOROPROPANE	BDL -	10	
1/Y•	TRANS 1 2 DICULOPOD DODENE	BDL	10	•
197.	TRANS-1,3-DICHLOROPROPENE TRICHLOROETHYLENE	BDL	10	• •
207	BENZENE	BDL BDL	10 10	
	CIS-1,3-DICHLOROPROPENE	BDL	10	•
22V	1,1,2-TRICHLOROETHANE	BDL	10	,
	DIBROMOCHLO ROMETHANE	BDL	10	12
	BROMOFORM	BDL BDL	10	44
	1,1,2,2-TETRACHLOROETHYLENE	BDL.	10	
	1,1,2,2-TETRACHLOROETHANE	BDL.	10	
27V	TOLUENE			
287		BDL BDL	10 10	
297.	ETHYLBENZENE	BDL BDL		
	2-CHLOROETHYL VINYL ETHER	BDL	10	
317.	DICHLORODIFLUOROMETHANE <sup>†</sup>	BDL	10	
32Y.	BIS(CHLOROMETHYL)ETHER <sup>†</sup>	BDL		
VL 1 •	nto louro mur uni r \r turk.	DUL		

BDL=BELOW DETECTION LIMIT

†See Data Report Notice

#### LABORATORY CHRONICLE

## SAMPLE IDENTIFIER: SD-1 Trip Blank · COMPUCHEM SAMPLE NUMBER: 32302

			•	
		•	!	Date
Recei	ved/Ref	frigerated	07/	27/84
Organ	ics			•
•	Extract	ed	Not	Required
	Analyze	e <b>d</b>		•
•	1.	Volatiles	07/3	30/84
<b>-P</b>	2.	Acid	Not	Requested
	3.	Base/Neutrals	Not	Requested
	4.	Pesticides/PCBS	Not	Requested
Inorg	anics	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1 .	
	1.	Metals	Not	Requested
	2.	Cyanide	Not	Requested
	3.	Phenols	Not	Requested
. •		· ·	•	

SAMPLE IDENTIFIER: SD-2 Trip Blank COMPUCHEM SAMPLE NUMBER: 32300

	VOLATILE ORGANICS		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)	SCAN NUMBER
17.	CHLOROMETHANE		BDL	10	
27.		•	BDL	10	
	CHLOROETHANE	•	BDL	10	
47.	BROMOMETHANE		BDL	10	
<b>5</b> 7.	ACROLEIN		BDL	100	
6V.	ACRYLONITRILE		BDL	100	•
77.	METHYLENE CHLORIDE		BDL	10	1
87.	TRICHLOROFLUOROMETHANE		BDL	10	
97.	1,1-DICHLOROETHYLENE		BDL	10	
107.	1,1-DICHLOROETHANE	•	BDL	10	
117.	TRANS-1,2-DICHLOROETHYLENE		BDL	10	
127.			BDL	10	
13V.	1,2-DICHLOROETHANE		BDL	10	
	1,1,1-TRICHLOROETHANE		BDL	10	
:15V.	CARBON TETRACHLORIDE		BDL	10	
16V.	BROMODICHLOROMETHANE		BDL	10	
177.	1,2-DICHLOROPROPANE		BDL	10	
<b>18V</b> .	TRANS-1,3-DICHLOROPROPENE		BDL	10	
	TRICHLOROETHYLENE		BDL	10	
201.	BENZENE		BDL	10	
217.	CIS-1,3-DICHLOROPROPENE		BDL	10	
221.	1,1,2-TRICHLOROETHANE		BDL	10	
237.	DIBROMOCHLOROMETHANE	,	BDL	10	
247.	BROMOFO RM	•	BDL	10	
	1,1,2,2-TETRACHLOROETHYLENE		BDL.	10	• 11 2
267.	1,1,2,2-TETRACHLOROETHANE		BDL	10	
271.	's TOLUENE		BDL.	10	
287.	CHLOROBENZENE	•	BDL	10	
291			BDL	10	
307	12-CHLOROETHYL VINYL ETHER		BDL	10	•
317.	DICHLORODIFLUOROMETHANET		BDL		
32V.	BIS(CHLOROMETHYL)ETHER <sup>†</sup>		BDL	•	****
and the s	🦊		•		

BDL=BELOW DETECTION LIMIT

See Data Report Notice

#### LABORATORY CHRONICLE

## SAMPLE IDENTIFIER: SD-2 Trip Blank COMPUCHEM SAMPLE NUMBER: 32300

		Date
Received/Re	frigerated	07/27/84
Organics		
Extrac	ted	Not Required
Analyz	ed	•
1.	Volatiles	07/30/84 J
2.	Acid	Not Requested
3.	Base/Neutrals	Not Requested
4.	Pesticides/PCBS	Not Requested
Inorganics		
1.	Metals	Not Requested
2.	Cyanide	Not Requested
. 3.	Phenols	Not Requested

## SAMPLE IDENTIFIER: SD-3 Trip Blank COMPUCHEM SAMPLE NUMBER: 32298

	VOLATILE ORGANICS	CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)	SCAN NUMBER
17.	CHLOROMETHANE	BDL	10	
27.	• • • • • • • • • • • • • • • • • • • •	BDL	10	
37.	CHLOROETHANE	BDL	10	•
47.		BDL	10	
5V .	ACROLEIN	BDL	100	
6V.	ACRYLONITRILE	BDL.	100	
77.		BDL	10	•
. 8V.		BDL	10	
97.	1,1-DICHLOROETHYLENE	BDL	10	
107.	1,1-DICHLOROETHANE	BDL	10	
117.	TRANS-1,2-DICHLOROETHYLENE	BDL	10	
127.	CHLOROFORM	BDL :	10	•
13V.	1,2-DICHLOROETHANE	BDL	10	
147.	1,1,1-TRICHLOROETHANE	BDL	10	
157.	CARBON TETRACHLORIDE	BDL	10	
164.	BROMODICHLOROMETHANE	BDL	10	
177.		<b>BDL</b>	10	
187.	TRANS-1,3-DICHLOROPROPENE	BDL	10	
197.	TRICHLOROETHYLENE	BDL	10	
201.		BDL	10	
217.	CIS-1,3-DICHLOROPROPENE	BDL ·	10	
22V.	1,1,2-TRICHLOROETHANE	BDL	10	
23V 🔐	DIBROMOCHLOROMETHANE	BDL	10	
247.	BROMOFO RM	BDL	10	
<b>25V.</b>	1,1,2,2-TETRACHLOROETHYLENE	BDL	10	
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	10	
27V.	TOLUENE	BDL	10	*
287.	CHLOROBENZENE	BDL	10	
	ETHYLBENZENE	BDL	10	
30V.	2-CHLOROETHYL VINYL ETHER	BDL	10	
31V.	DICHLORODIFLUOROMETHANE†	BDL	10	
32V.'	BIS(CHLOROMETHYL)ETHER <sup>†</sup>	BDL		

BDL=BELOW DETECTION LIMIT

†See Data Report Notice

#### LABORATORY CHRONICLE

## SAMPLE IDENTIFIER: SD-3 Trip Blank COMPUCHEM SAMPLE NUMBER: 32298

	Date
Received/Refrigerated	07/27/84
Organics	
Extracted	Not Required
Analyzed	. •
1. Volatiles	07/30/84
2. Acid	Not Requested
3. Base/Neutrals	Not Requested
4. Pesticides/PCBS	Not Requested
Inorganics	
1. Metals	Not Requested
2. Cyanide	Not Requested
3. Phenols	Not Requested

#### CompuChem **LABORATORIES**

#### REPORT OF DATA

SAMPLE IDENTIFIER: SD-3 Trip Blank SD-2

Trip Blank

Trip Blank SD-1

COMPUCHEM SAMPLE NUMBER: 32298 32300

32302

#### SUBMITTED TO:

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 30329 Atlanta, GA

> DIANA A. SCAMMELL TECHNICAL SPECIALIST, OPERATIONS

R. L. MYERS, PH.D., PRESIDENT,

ROBERT E. MEIERER DIRECTOR OF QUALITY ASSURANCE

#### DATA REPORT NOTICE

CompuChem employs Methods 624 and 625 for GC/MS analysis of organics in liquid matrices. These methods were proposed on December 3, 1979 by the U.S.E.P.A. in Volume 44 of the Federal Register. These methods were subsequently revised and reissued in July, 1982 as publication EPA-600/4-82-057. The EPA Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) has subsequently issued method modifications which provide for the analysis of solid matrices. These modifications specify changes in the sample preparation procedures.

Additionally, for solid samples detection limits and any analytical results reported are based on processing the method specified sample size of as-received material.

The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic polluant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

CompuChem® presents these compounds in its sample data report for completeness as many of the government compound list forms continue to display the affected compounds. For consistency, these compounds are reported as "BDL" or "Below Detection Limit" as they are either not likely to exist in the sample or are not likely to be detected by the method. Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	Federal Register	Date
Dichlorodifluoromethane	Volatile	46FR2264	1/8/81
*Trichlorofluoromethane	Volatile	46FR2264	1/8/81
Bis(Chloromethyl)Ether	Volatile	46FR10723	2/4/81

\*While this compound has been deleted, CompuChem® continues to identify and quantitate for it.

# COMPUCHEM LABORATORIES IS NO LONGER AFFILIATED WITH MEAD CORPORATION.

Washy for redirect & 6 W

3308 East Chapel Hill/Nelson Highway P.O. Box 12652 Research Triangle Park, NC 27709

Telephone: 919-549-8263 800-334-8525

August 7, 1984

CompuChem LABORATORIES

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

Dear Mr. Schroder:

Thank you for selecting CompuChem® Laboratories for your recent sample analysis. We have completed the analysis that you requested and have enclosed a summary of the CompuChem® data for your review. Additional data details are available for purchase if you require them.

As you know, EPA has proposed detection limits for the priority pollutants in the December 3, 1979, Federal Register, and we have reported all priority pollutant concentrations which have exceeded these limits (or their equivalent for solid matrices). In addition, we have permanently stored a complete record of your data on magnetic tape. This includes chromatograms, mass spectra, calibration and quality control data for the organics. Therefore, your original data is readily available for future reference. Should you require additional information from your data base, please contact us at 1/800-334-8525.

In order to expedite data to you, we have forwarded the results for all completed analyses. If you submitted more samples than are included in the enclosed results, the data will be forthcoming upon completion of our final review.

Your confidence in our CompuChem® service is appreciated. We look forward to a continuing association.

Sincerely,

Customer Service Dept. CompuChem®

Enclosure:

Report: SD-3 Trip Blank - 32298 SD-2 Trip Blank - 32300 SD-1 Trip Blank - 32302



5) SEDIMENT DATA

## COMPUCHEM LABORATORIES

August 29, 1984

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

Dear Mr. Schroder:

#### SEP 04 1984

Thank you for selecting CompuChem® Laboratories for your recent sample analysis. We have completed the analysis that you requested and have enclosed a summary of the CompuChem® data for your review. Additional data details are available for purchase if you require them.

As you know, EPA has proposed detection limits for the priority pollutants in the December 3, 1979, Federal Register, and we have reported all priority pollutant concentrations which have exceeded these limits (or their equivalent for solid matrices). In addition, we have permanently stored a complete record of your data on magnetic tape. This includes chromatograms, mass spectra, calibration and quality control data for the organics. Therefore, your original data is readily available for future reference. Should you require additional information from your data base, please contact us at 1/800-334-8525.

In order to expedite data to you, we have forwarded the results for all completed analyses. If you submitted more samples than are included in the enclosed results, the data will be forthcoming upon completion of our final review.

Your confidence in our CompuChem® service is appreciated. We look forward to a continuing association.

Sincerely,

Customer Service Dept. CompuChem®

#### Enclosure:

Report: SD-3 - 32411 SD-2 - 32412 SD-1 - 32413

#### DATA REPORT NOTICE

CompuChem employs Methods 624 and 625 for GC/MS analysis of organics in liquid matrices. These methods were proposed on December 3, 1979 by the U.S.E.P.A. in Volume 44 of the Federal Register. These methods were subsequently revised and reissued in July, 1982 as publication EPA-600/4-82-057. The EPA Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) has subsequently issued method modifications which provide for the analysis of solid matrices. These modifications specify changes in the sample preparation procedures.

Additionally, for solid samples detection limits and any analytical results reported are based on processing the method specified sample size of asreceived material.

The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic pollutant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

CompuChem® presents these compounds in its sample data report for completeness as many of the government compound list forms continue to display the affected compounds. For consistency, these compounds are reported as "BDL" or "Below Detection Limit" as they are either not likely to exist in the sample or are not likely to be detected by the method. Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	Federal Register	<u>Date</u>
Dichlorodifluoromethane	Volatile	46FR2264	1/8/81
*Trichlorofluoromethane	Volatile	46FR2264	1/8/81
Bis(Chloromethyl)Ether	Volatile	46FR10723	2/4/81

<sup>\*</sup>While this compound has been deleted, CompuChem® continues to identify and quantitate for it.

#### LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32411

Samples:

Received - 7-26-84 Analyzed - 8-02-84

SAMPLE IDENTIFIER: SD-3

SD-2

SD-1

COMPUCHEM SAMPLE NUMBER: 32411

32412

32413

#### SUBMITTED TO:

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

> DIANA A. SCAMMELL TECHNICAL SPECIALIST, OPERATIONS

R. L. MYERS, PH.D., PRESIDENT

ROBERT E. MEIERER
DIRECTOR OF QUALITY ASSURANCE

SAMPLE IDENTIFIER: SD-3
COMPUCHEM SAMPLE NUMBER: 32411

INORGANICS PRIORITY POLLUTANTS	CONCENTRATION (MG/KG)	DETECTION LIMIT (MG/KG)
the state of the s		
CVANIDE TOTAL	BDL	1.0

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32412

INORGANICS PRIORITY POLLUTANTS	CONCENTRATION (MG/KG)	DETECTION LIMIT (MG/KG)
CYANIDE. TOTAL	BDL	1.0

SAMPLE IDENTIFIER: SD-1
COMPUCHEM SAMPLE NUMBER: 32413

INORGANICS PRIORITY POLLUTANTS	CONCENTRATION (MG/KG)	DETECTION LIMIT (MG/KG)
CYANIDE, TOTAL	BDL	1.0

## COMPUCHEM LABORATORIES



August 31, 1984

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

SEP 06 1984

Engineering Commune Atlanta

Dear Mr. Schroder:

Thank you for selecting CompuChem® Laboratories for your recent sample analysis. We have completed the analysis that you requested and have enclosed a summary of the CompuChem® data for your review. Additional data details are available for purchase if you require them.

As you know, EPA has proposed detection limits for the priority pollutants in the December 3, 1979, Federal Register, and we have reported all priority pollutant concentrations which have exceeded these limits (or their equivalent for solid matrices). In addition, we have permanently stored a complete record of your data on magnetic tape. This includes chromatograms, mass spectra, calibration and quality control data for the organics. Therefore, your original data is readily available for future reference. Should you require additional information from your data base, please contact us at 1/800-334-8525.

In order to expedite data to you, we have forwarded the results for all completed analyses. If you submitted more samples than are included in the enclosed results, the data will be forthcoming upon completion of our final review.

Your confidence in our CompuChem® service is appreciated. We look forward to a continuing association.

Sincerely.

Customer Service Dept. CompuChem®

Enclosure:

Report: SD-2 - 32299

#### DATA REPORT NOTICE

CompuChem employs Methods 624 and 625 for GC/MS analysis of organics in liquid matrices. These methods were proposed on December 3, 1979 by the U.S.E.P.A. in Volume 44 of the Federal Register. These methods were subsequently revised and reissued in July, 1982 as publication EPA-600/4-82-057. The EPA Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) has subsequently issued method modifications which provide for the analysis of solid matrices. These modifications specify changes in the sample preparation procedures.

Additionally, for solid samples detection limits and any analytical results reported are based on processing the method specified sample size of as-received material.

The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic pollutant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

CompuChem® presents these compounds in its sample data report for completeness as many of the government compound list forms continue to display the affected compounds. For consistency, these compounds are reported as "BDL" or "Below Detection Limit" as they are either not likely to exist in the sample or are not likely to be detected by the method. Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	Federal Register	<u>Date</u>
Dichlorodifluoromethane *Trichlorofluoromethane	Volatile Volatile	46FR2264 46FR2264	1/8/81 1/8/81
Bis(Chloromethyl)Ether	Volatile	46FR10723	. 2/4/81

<sup>\*</sup>While this compound has been deleted, CompuChem® continues to identify and quantitate for it.

#### REPORT OF DATA

SAMPLE IDENTIFIER: SD-2

COMPUCHEM SAMPLE NUMBER: 32299

#### SUBMITTED TO:

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

DIANA A. SCAMMELL
TECHNICAL SPECIALIST, OPERATIONS

R. L. MYERS, PH.D., PRESIDENT

ROBERT E. MEIERER DIRECTOR OF QUALITY ASSURANCE

#### LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

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#### COMPOUND LIST

#### **VOLATILES ORGANICS**

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

•			NTRATION G/KG)	LIMIT (UG/KG)
17.	CHLOROMETHANE		BDL	10
24.	VINYL CHLORIDE	:	BDL	10
	CHLOROETHANE	1	BDL	10
47.	· · · · · · · · · · · · · · · · · · ·	٠.	BDL	10
5V	ACROLEIN		BDL	100
6V.	ACRYLONITRILE		BDL	100
77.	METHYLENE CHLORIDE	NDB*		. 10
. 8V 📭	TRICHLOROFLUOROMETHANE		BDL	10
97.	1,1-DICHLOROETHYLENE	•	BDL	10
: 10V 🕞	1,1-DICHLOROETHANE		BDL ·	10
117.	TRANS-1,2-DICHLOROETHYLENE	• •	BDL	10
12V.	CHLOROFORM	• .	BDL.	10
	1,2-DICHLOROETHANE		BDL	10
147.	1,1,1-TRICHLOROETHANE		BDL	10
	CARBON TETRACHLORIDE	•	BDL	10
16V.	BROMODICHLOROMETHANE	•	BDL	10
177.	1,2-DICHLOROPROPANE		BOL	. 10
. 18V . 🦮	TRANS-1,3-DICHLOROPROPENE		BDL	10
	TRICHLOROETHYLENE		BDL	10
200.	RENZENE		BDL	10
	CIS-1,3-DICHLOROPROPENE	•	BDL	10
227!	1,1,2-TRICHLOROETHANE	•	BDL	10
237.	DIBROMOCHLOROMETHANE BROMOFORM		BDL	10
		r <sub>ing</sub> .	BDL	10
257	1,1,2,2-TETRACHLOROETHYLENE		BDL	10
	1,1,2,2-TETRACHLOROETHANE		BDL	10
277 .	TOLUENE		BDL	10
	CHLOROBENZENE		BDL -	10
	ETHYLBENZENE		BDL	10
	2-CHLOROETHYL VINYL ETHER		BDL	10
	DICHLORODIFLUOROMETHANE†		BDL	
32 <b>V</b> @	BIS(CHLOROMETHYL)ETHER <sup>†</sup>		BDL	

BDL=BELOW DETECTION LIMIT \*See Quality Assurance Notice

†See Data Report Notice

#### QUALITY ASSURANCE NOTICE

CompuChem Sample No. 32299

Although not required by the Federal Register, December 3, 1979 (modified July, 1982) Volatile Method 624 procedure, the laboratory prepares VOA blanks when compositing water samples and preparing low and medium level hazardous waste VOA samples. This is to insure that the glassware used is free from contamination, and to monitor the possibility of cross-contamination from high levels of volatile organic compounds in some samples and the laboratory atmosphere.

The compositing or method blank (# 32330) prepared with this sample contained the compound(s) listed below. Sample data associated with this blank have been adjusted and/or flagged according to the EPA-recommended methods.

Compound(s)	Concentration Found In Sample (ug/kg)	Applicable Qualifier*
Methylene Chloride	44	NDB

The following data qualifiers are used by EPA and adopted by CompuChem® for reporting purposes:

NDB = The concentration of a priority pollutant in the blank is greater than 1/2 the detection limit and is greater than 1/2 the concentration in the sample.

\*No adjusted sample concentration is reported.

#### COMPOUND LIST -- ACID EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

	•		CONCENTRATION (UG/KG)	DETECTION <sup>†</sup> LIMIT (UG/KG)
1A. PHENOL			BDL	500
2A. 2-CHLOROPHENOL			BOL	500
3A. 2-NITROPHENOL	•		BDL	500
4A. 2,4-DIMETHYLPHENOL			BDL	500
5A. 2,4-DICHLOROPHENOL		•	BDL	500
6A. P-CHLORO-M-CRESOL		•	BDL	500
7A. 2,4,6-TRICHLOROPHENOL			BDL	500
8A. 2,4-DINITROPHENOL			BDL	5000
9A. 4-NITROPHENOL	•		BDL	500
10A. 4,6-DINITRO-O-CRESOL	•	•	BDL	5000
11A., PENTACHLOROPHENOL			BDL	<b>500</b> ·
* i • • • • •			·	

BDL=BELOW DETECTION LIMIT TSee Data Report Notice

#### COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

	CONCENTRATION (UG/KG)	DETECTION† LIMIT (UG/KG)
1B. N-NITROSODIMETHYLAMINE	BDL	200
2B. BIS (2-CHLOROETHYL) ETHER	BDL	200
3B. 1,3-DICHLOROBENZENE	BDL	200
4B. 1,4-DICHLOROBENZENE	BDL	200
5B. 1,2-DICHLOROBENZENE	BDL	200
6B. BIS (2-CHLOROISOPROPYL) ETHER	BDL	200
7B. HEXACHLOROETHANE	BDL	200
8B. N-NITROSODI-N-PROPYLAMINE	BDL	200
9B. NITROBENZENE	BDL	200
10B. ISOPHORONE	BDL	200
11B. BIS(2-CHLOROETHOXY) METHANE	BDL	200
12B. 1,2,4-TRICHLOROBENZENE	BDL.	200
13B. NAPHTHALENE	BDL	200
14B. HEXACHLOROBUTADIENE	· BDL	. 200
15B. HEXACHLOROCYCLOPENTADIENE	BDL.	200
16B. 2-CHLORONAPHTHALENE	BDL	200.
17B. DIMETHYLPHTHALATE	BDL	200
18B. ACENAPHTHYLENE	: BDL -	200
19B. 2,6-DINITROTOLUENE	BDL.	200
20B. ACENAPHTHENE	BDL	200
21B. 2,4-DINITROTOLUENE	BDL.	200
22B. DIETHYLPHTHALATE	BDL	200
23B. FLUORENE	BDL	200
24B. 4-CHLOROPHENYL PHENYL ETHER	BDL	200
25B. DIPHENYLAMINE (N-NITROSO)	BDL	200
26B. 1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	200
27B. 4-BROMOPHENYL PHENYL ETHER	BDL	200
28B. HEXACHLOROBENZENE	BDL	200
4 (4 + 3	•	

BDL=BELOW DETECTION LIMIT TSee Data Report Notice

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

		CONCENTRATION (UG/KG)	LIMIT (UG/KG)
29B.	PHENANTHRENE	BDL	200
30B.	ANTHRACENE	BDL	200
31B.	DI-N-BUTYLPHTHALATE	BDL	200
32B.	FLUORANTHENE	* BDL	200
33B.	BENZIDINE	BDL	200
34B.	PYRENE	BDL	200
35B.	BUTYLBENZYLPHTHALATE	BDL	200
36B.	BENZO(A)ANTHRACENE	BDL	200
	3,3'-DICHLOROBENZIDINE	BDL .	200
	CHRYSENE	BDL	200
	BIS(2-ETHYLHEXYL)PHTHALATE	· BDL	200
40B.	DI-N-OCTYLPHTHALATE	BDL.	200
41B.		BDL	200
42B.	BENZO(K)FLUORANTHENE	BDL.	200
	BENZO(A)PYRENE	BDL	200
	INDENO(1,2,3-C,D)PYRENE	BDL.	500
45B.	DIBENZO(A,H)ANTHRACENE	BDL.	500 -
46B.	BENZO(G,H,I)PERYLENE	BDL	500

BDL=BELOW DETECTION LIMIT †See Date Report Notice

#### COMPOUND LIST -- PESTICIDES/PCB'S

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

		CONCENTRATION (UG/KG)	DETECTION <sup>†</sup> LIMIT (UG/KG)
1P.	ALDRIN	BDL	200
2P.	ALPHA-BHC	BDL	200
3P.	BETA-BHC	BDL	<b>200</b> .
4P.	GAMMA-BHC	BDL	200
5P.	DELTA-BHC	BDL	200
6P.	CHLORDANE	BDL	200
7P.	4,4'-DDT	BDL	200
8P.	4,4'-DDE	BDL	200
9P.	4,4'-DDD	BDL	200
10P •	DIELDRIN	BDL	200
11P.	ALPHA-ENDOSULFAN	BDL	200
12P •	BETA-ENDOSULFAN	BDL .	200
13P.	ENDOSULFAN SULFATE	BDL	200
14P.	ENDRIN	BDL	200
15P.	ENDRIN ALDEHYDE	BDL	200
16P •	HEPTACHLOR	BDL	200
17P.	HEPTACHLOR EPOXIDE	BDL	200
18P	PCB-1242	BDL	200
19P.	PCB-1254	BDL	200
20P •	PCB-1221	BDL	200
21P.	PCB-1232	BDL	200 . ,
22P •	PCB-1248	BDL	200
23P •	PCB-1260	BDL	200
24P .	PCB-1016	BDL	200
25P.	TOXAPHENE	BDL	200

BDL=BELOW DETECTION LIMIT TSee Data Report Notice

#### COMPOUND LIST

INORGANICS (METALS)

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

	INORGANICS PRIORITY POLLUTANT	<b>S</b>	CONCENTRATION (UG/G)	(UG/G)
2. 3. 4. 5.	CADMIUM, TOTAL CHROMIUM, TOTAL COPPER, TOTAL LEAD, TOTAL* MERCURY, TOTAL NICKEL, TOTAL ZINC, TOTAL		BDL 6.3 8.2 7.0 0.064 8.5 34	0.20 0.50 1.0 0.50 0.0020 1.0 0.20

BDL=BELOW DETECTION LIMIT †See Data Report Notice

\*Lead analyzed by Flame AAS because of concentration level found.

3308 East Chapel Hill/Nelson Highway P.O. Box 12652 Research Triangle Park, NC 27709

### CompuChem

**LABORATORIES** 

Telephone: 919-549-8263 800-334-8525

August 27, 1984

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

SEP 04 1984

Dear Mr. Schroder:

Thank you for selecting CompuChem® Laboratories for your recent sample analysis. We have completed the analysis that you requested and have enclosed a summary of the CompuChem® data for your review. Additional data details are available for purchase if you require them.

As you know, EPA has proposed detection limits for the priority pollutants in the December 3, 1979, Federal Register, and we have reported all priority pollutant concentrations which have exceeded these limits (or their equivalent for solid matrices). In addition, we have permanently stored a complete record of your data on magnetic tape. This includes chromatograms, mass spectra, calibration and quality control data for the organics. Therefore, your original data is readily available for future reference. Should you require additional information from your data base, please contact us at 1/800-334-8525.

In order to expedite data to you, we have forwarded the results for all completed analyses. If you submitted more samples than are included in the enclosed results, the data will be forthcoming upon completion of our final review.

Your confidence in our CompuChem® service is appreciated. We look forward to a continuing association.

Sincerely,

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Customer Service Dept. CompuChem®

Enclosure:

<sup>6</sup> Report: SD-3 - 32297

SD-1 - 32301

#### DATA REPORT NOTICE

CompuChem employs Methods 624 and 625 for GC/MS analysis of organics in liquid matrices. These methods were proposed on December 3, 1979 by the U.S.E.P.A. in Volume 44 of the Federal Register. These methods were subsequently revised and reissued in July, 1982 as publication EPA-600/4-82-057. The EPA Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) has subsequently issued method modifications which provide for the analysis of solid matrices. These modifications specify changes in the sample preparation procedures.

Additionally, for solid samples detection limits and any analytical results reported are based on processing the method specified sample size of as-received material.

The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic pollutant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

CompuChem® presents these compounds in its sample data report for completeness as many of the government compound list forms continue to display the affected compounds. For consistency, these compounds are reported as "BDL" or "Below Detection Limit" as they are either not likely to exist in the sample or are not likely to be detected by the method. Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	Federal Register	Date
Dichlorodifluoromethane	Volatile	46FR2264	1/8/81
*Trichlorofluoromethane	Volatile	46FR2264	1/8/81
Bis(Chloromethyl)Ether	Volatile	46FR10723	2/4/81

\*While this compound has been deleted, CompuChem® continues to identify and quantitate for it.

## CompuChem LABORATORIES

REPORT OF DATA

SAMPLE IDENTIFIER

COMPUCHEM SAMPLE NUMEBER

SD-3 SD-1 32297 32301

SUBMITTED TO:

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

> DIANA A. SCAMMELL TECHNICAL SPECIALIST, OPERATIONS

R. L. MYERS, PH.D., PRESIDENT

ROBERT E. MEIERER DIRECTOR OF QUALITY ASSURANCE

#### LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32297

		<u>Date</u>
Received/Ref	frigerated	7-27-84
Organics		•
Extract	ed	8-1-84
Analyze	ed	
1.	Volatiles	7-30-84
2.	Acid	8-8-84
3.	Base/Neutrals	8-4-84
4.	Pesticides/PCBS	8-4-84
Inorganics	r	• .
1.	Metals	8-14-84
2.	Cyanide	Not Requested
3.	Pheno1s	Not Requested

SAMPLE IDENTIFIER: COMPUCHEM SAMPLE NUMBER:

		CONCENTRATION (UG/KG)	DETECTION LIMIT (UG/KG)
17.	CHLOROMETHANE	BDL	10
	VINYL CHLORIDE	BDL.	10
37.	CHLOROETHANE	BDL	10
47.	BROMOMETHANE	BDL	10
5V.	ACROLEIN	BDL	100
6V.	ACRYLONITRILE	,BDL ,	100
77.	METHYLENE CHLORIDE	BDL	10
8V.	TRICHLOROFLUOROMETHANE	BDL	<b>10</b> .
97.	1,1-DICHLOROETHYLENE	BDL	10
10V.:	1,1-DICHLOROETHANE TRANS-1,2-DICHLOROETHYLENE CHLOROFORM 1,2-DICHLOROETHANE	BDL	10
117.	TRANS-1,2-DICHLOROETHYLENE	BDL :	10
120.	CHLOROFORM	BDL	10
13V.	1,2-DICHLOROETHANE	BDL	10
144 ·	1,1,1-IRICHLORUEINANE	BOL	. 10
	CARBON TETRACHLORIDE	BDL.	10
	BROMODICHLOROMETHANE	BDL	10
177.	1,2-DICHLOROPROPANE	BDL	10
	TRANS-1,3-DICHLOROPROPENE	BDL	10
	TRICHLOROETHYLENE	BDL	10
	BENZENE	BDL	10
	CIS-1,3-DICHLOROPROPENE	BDL	10
	1,1,2-TRICHLOROETHANE	BDL	10
	DIBROMOCHLOROMETHANE	BDL	10
	BROMOFORM	BDL	10
	1,1,2,2-TETRACHLOROETHYLENE	BDL	10
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	10
	TOLUENE	BDL	10
	CHLOROBENZENE	BDL	10
	ETHYLBENZENE	BDL	10 .
	2-CHLOROETHYL VINYL ETHER	BDL	10
31V.		BDL	
32V.	BIS(CHLOROMETHYL)ETHER <sup>†</sup>	BDL	

#### BDL=BELOW DETECTION LIMIT

<sup>†</sup>See Data Report Notice

#### COMPOUND LIST -- ACID EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32297

		CONCENTRATION (UG/KG)	DETECTION* LIMIT (UG/KG)
1A.	PHENOL	BDL	500
; 2A.	2-CHLOROPHENOL	BDL	500
3A.	2-NITROPHENOL	BDL	500
4A.	2,4-DIMETHYLPHENOL	BDL	500
5A.	2,4-DICHLOROPHENOL	BDL	500
6A 🔩	P-CHLORO-M-CRESOL	BDL	500
7A:	2,4,6-TRICHLOROPHENOL	BDL	500
8A.	2,4-DINITROPHENOL	BDL	5000
9A.	4-NITROPHENOL	BDL	500
10A.	4,6-DINITRO-O-CRESOL	BDL	5000
11A.	PENTACHLOROPHENOL	BDL	500

BDL=BELOW DETECTION LIMIT \*Detection limits based on processing 50g of as-received sample.

# COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLE ORGANICS

**DETECTION\*** 

SAMPLE IDENTIFIER: SD-3
COMPUCHEM SAMPLE NUMBER: 32297

		CONCENTRATION (UG/KG)	LIMIT (UG/KG)
4B. 5B. 6B. 7B. 8B. 9B. 10B. 11B. 12B. 13B. 14B. 15B. 16B. 17B. 18B. 19B. 20B. 21B. 22B.	NITROBENZENE ISOPHORONE BIS(2-CHLOROETHOXY) METHANE 1,2,4-TRICHLOROBENZENE NAPHTHALENE HEXACHLOROBUTADIENE HEXACHLOROCYCLOPENTADIENE 2-CHLORONAPHTHALENE DIMETHYLPHTHALATE ACENAPHTHYLENE 2,6-DINITROTOLUENE ACENAPHTHENE 2,4-DINITROTOLUENE DIETHYLPHTHALATE	BDL	200 200 200 200 200 200 200 200 200 200
23B • 24B • 25B • 26B • 27B	FLUURENE DUENVI ETHER	BDL BDL BDL BDL BDL	200 200 200 200 200
	• • • • • • • • • • • • • • • • • • • •	. :	

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32297

	CONCENTRATION (UG/KG)	DETECTION* LIMIT (UG/KG)
29B. PHENANTHRENE	BDL	200
30B. ANTHRACENE	BDL	200
31B. DI-N-BUTYLPHTHALATE	BDL	200
32B. FLUORANTHENE	BDL	200
33B. BENZIDINE	BDL	200
34B. PYRENE	BDL	200
35B. BUTYLBENZYLPHTHALATE	BDL	200
36B. BENZO(A)ANTHRACENE	BDL	200
37B. 3.3'-DICHLOROBENZIDINE	BDL	200
38B. CHRYSENE	BDL	200
39B. BIS(2-ETHYLHEXYL)PHTHALATE	BDL	200
40B. DI-N-OCTYLPHTHALATE	BDL	200
41B. BENZO(B)FLUORANTHENE	BDL	200
42B. BENZO(K)FLUORANTHENE	BDL	200
43B. BENZO(A)PYRENE	BDL	200
44B. INDENO(1,2,3-C,D)PYRENE	BDL	500
45B. DIBENZO(A,H)ANTHRACENE	BDL	500
46B. BENZO(G,H,I)PERYLENE	BDL	500

# COMPOUND LIST -- PESTICIDES/PCB'S

SAMPLE IDENTIFIER: SD-3
COMPUCHEM SAMPLE NUMBER: 32297

				ČO	NCENTRATION (UG/KG)	DETECTION LIMIT (UG/KG)	*
1P.	ALDRIN		•		BDL .	200	
. 2P.	ALPHA-BHC			•	BDL i	200	
;3P.	BETA-BHC				BDL	200	
4P.	GAMMA-BHC				BDL	200	
5P.	DELTA-BHC			•	BDL	200	
6P.	CHLORDANE	•			BDL	200	
7P.	4,4'-DDT			,	BDL	200	•
8P.	4,4'-DDE				· BDL	200	
9P.	4,4'-DDD				BDL	200	;
10P.	DIELDRIN				BDL	200	
11P.	THE THE LINE OF		•		BDL	200	:
12P.					BDL	200	
	ENDOSULFAN	SULFATE			BDL.	200	
14P.	ENDRIN				BDL	200	
15P.	ENDRIN ALDE	HYDE			BDL	200	
16P.	HEPTACHLOR		1	:	BDL	200	
17P.		EPOXIDE ,	•		BDL	200	
18P.	PCB-1242		۲.		BDL	200	
	PCB-1254	1.1	•	<i>:</i>	BDL	200 -	,
	PCB-1221	1.			BDL	200	
21P.	PCB-1232				BDL	200	. 1
22P.	PCB-1248				BDL	200	
	PCB-1260		•		BDL	200	٠.
	PCB-1016			100	BDL	200	
25P.	TOXAPHENE	• •		•	BDL	200	•

# COMPOUND LIST -- INORGANICS PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32297

	CONCENTRATION DE (UG/G)	TECTION LIMIT (UG/G)
1. CADMIUM 2. CHROMIUM 3. COPPER 4. LEAD * 5. MERCURY 6. NICKEL 7. ZINC	BDL 5.6 10.0 14 0.010 9.4 48	0.20 0.50 1.0 0.50 0.0020 1.0 0.20

# BDL=BELOW DETECTION LIMIT

\*Lead analyzed by Flame AAS because of concentration level found.

# LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-1 COMPUCHEM SAMPLE NUMBER: 32301

	<u>Date</u>
Received/Refrigerated	7-27-84
Organics	
Extracted	8-1-84
Analyzed	
1. Volatiles	7-31-84
2. Acid	8-8-84
3. Base/Neutrals	8-6-84
4. Pesticides/PCBS	8-6-84
Inorganics	
1. Metals	8-14-84
2. Cyanide	Not Requested
3. Phenols	Not Requested

#### VOLATILES ORGANICS

SAMPLE IDENTIFIER: SD-1
COMPUCHEM SAMPLE NUMBER: 32301

· 神奇"			CONCENTRATION (UG/KG)	LIMIT (UG/KG)
5V. 6V. 7V. 8V. 9V. 10V. 11V. 12V. 14V. 15V. 16V. 17V. 20V. 22V. 23V. 24V. 25V. 26V.	BROMOMETHANE ACROLEIN ACRYLONITRILE METHYLENE CHLORIDE TRICHLOROFLUOROMETHANE 1,1-DICHLOROETHYLENE 1,1-DICHLOROETHANE TRANS-1,2-DICHLOROETHYLENE CHLOROFORM 1,2-DICHLOROETHANE CARBON TETRACHLORIDE BROMODICHLOROMETHANE 1,2-DICHLOROPROPANE TRANS-1,3-DICHLOROPROPENE TRICHLOROETHYLENE BENZENE CIS-1,3-DICHLOROPROPENE 1,1,2-TRICHLOROETHANE DIBROMOCHLOROMETHANE BROMOFORM 1,1,2,2-TETRACHLOROETHYLENE 1,1,2,2-TETRACHLOROETHYLENE 1,1,2,2-TETRACHLOROETHANE TOLUENE	•		LIMIT
28V. 29V. 30V. 31V. 32V.	CHLOROBENZENE ETHYLBENZENE 2-CHLOROETHYL VINYL ETHER DICHLORODIFLUOROMETHANE† BIS(CHLOROMETHYL)ETHER†		BDL BDL BDL BDL	10 10

BDL=BELOW DETECTION LIMIT

See Data Report Notice

# COMPOUND LIST -- ACID EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-1
COMPUCHEM SAMPLE NUMBER: 32301

	CONCENTRATION (UG/KG)	LIMIT (UG/KG)
1A. PHENOL	BDL	500
2A. 2-CHLOROPHENOL	BDL	500
	BDL .	. 500
	BDL	500
4A. 2,4-DIMETHYLPHENOL	BDL.	500
5A. 2,4-DICHLOROPHENOL	BDL	500
6A. P-CHLORO-M-CRESOL	BDL	500
7A. 2,4,6-TRICHLOROPHENOL	- · ·	5000
8A. 2,4-DINITROPHENOL	BDL	
9A. 4-NITROPHENOL	BDL	500
10A. 4,6-DINITRO-O-CRESOL	BDL	5000
	BDL	<b>500</b> .
11A. PENTACHLOROPHENOL	, , , , , , , , , , , , , , , , , , , ,	

## COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-1 COMPUCHEM SAMPLE NUMBER: 32301

					DETECTION*
			CONCENT (UG/		LIMIT (UG/KG)
. 1B.	N-NITROSODIMETHYLAMINE		·	BDL	200
2B.	BIS (2-CHLOROETHYL) ETHER			BDL	200
	1,3-DICHLOROBENZENE		•	BDL	200
4B.	1,4-DICHLOROBENZENE		•	BDL	200
	1,2-DICHLOROBENZENE	•	.*•	BDL	200
6B.	BIS (2-CHLOROISOPROPYL) ETHER		•	BDL	200
, 7B.	HEXACHLOROETHANE			BOL	200
8B.	N-NITROSODI-N-PROPYLAMINE			BOL	200
9B.	NITROBENZENE			BDL	200
10B.	ISOPHORONE			BDL	200
11B.	BIS(2-CHLOROETHOXY) METHANE			BDL	200
12B.	1,2,4-TRICHLOROBENZENE			BDL	200
	NAPHTHALENE			BDL	200
	HEXACHLOROBUTADIENE			BDL	200
	HEXACHLOROCYCLOPENTADIENE			BOL	200
16B.	2-CHLORONAPHTHALENE			BDL	200
17B.	DIMETHYLPHTHALATE			BDL	200
18B.	ACENAPHTHYLENE	:		BDL.	200
19B.	2,6-DINITROTOLUENE			BDL	200
20B.	ACENAPHTHENE			BDL	200
21B.	2,4-DINITROTOLUENE	•	•	BDL	200
22B.	DIETHYLPHTHALATE		• •	BDL	200
23B.	FLUORENE	•	•	BDL	200
24B.				BDL	200
	DIPHENYLAMINE (N-NITROSO) ·			BDL	200
	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)			BDL	200
27B.	4-BROMOPHENYL PHENYL ETHER		. ,	BDL	200
	HEXACHLOROBENZENE			BDL	200
				•	

SAMPLE IDENTIFIER: SD-1 COMPUCHEM SAMPLE NUMBER: 32301

				DETECTION*
			CONCENTRATION (UG/KG)	LIMIT (UG/KG)
29B.	PHENANTHRENE	•	BDĹ.	200
30B.	ANTHRACENE		BDL	200
31B.	DI-N-BUTYLPHTHALATE		BDL	200
32B.	FLUORANTHENE		BDL	200
33B.	BENZIDINE		BDL	200
34B.	PYRENE		BDL	200
35B.	BUTYLBENZYLPHTHALATE		BDL.	200
36B.	BENZO(A)ANTHRACENE	•	BDL.	200
37B.	3,3'-DICHLOROBENZIDINE	•	BDL	200
38B.	CHRYSENE	•	BDL.	200
39B.	BIS(2-ETHYLHEXYL)PHTHALATE		BDL	200
40B.	DI-N-OCTYLPHTHALATE		BDL.	200
41B.	BENZO(B)FLUORANTHENE		BDL	200
42B.	BENZO(K)FLUORANTHENE		BDL	200
43B.	BENZO(A)PYRENE	·.	BDL	200
44B.	INDENO(1,2,3-C,D)PYRENE	7	BDL.	500
45B.	DIBENZO(A,H)ANTHRACENE	•	BDL	500
46B.	BENZO(G,H,I)PERYLENE		BDL	500

# COMPOUND LIST -- PESTICIDES/PCB'S

SAMPLE IDENTIFIER: SD-1
COMPUCHEM SAMPLE NUMBER: 32301

		CONCENTRATION (UG/KG)	DETECTION* LIMIT (UG/KG)
10 6	NI DDIN	BDL.	<b>200</b> .
	ALDRIN	BDL	200
	ALPHA-BHC	BDL	200
	BETA-BHC	BDL	200
	GAMMA-BHC Delta-bhc	BDL	200
	CHLORDANE	BDL	200
	1,4'-DDT	BDL	200
	1,4'-DDE	BDL	200
	1,4'-DDD	BDL	200
		BDL	200
	DIELDRIN	BDL	200
, .	ALPHA-ENDOSULFAN	BDL	200
	BETA-ENDOSULFAN	BDL	200
	ENDOSULFAN SULFATE	BDL	200
	ENDRIN	BDL	200
	ENDRIN ALDEHYDE	BDL	200
	HEPTACHLOR	BDL	200
	HEPTACHLOR EPOXIDE	BDL	200
	PCB-1242	BDL	200
	PCB-1254	BDL	200
	PCB-1221		200
	PCB-1232	BDL	200
	PCB-1248	BDL	
23P.	PCB-1260	BDL	200
	PCB-1016	BDL.	200
	TOXAPHENE	BDL	200

## COMPOUND LIST -- INORGANICS PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: SD-1 COMPUCHEM SAMPLE NUMBER: 32301

ond North	CONCENTRATION (UG/G)	(UG/G)
1. CADMIUM, TOTAL 2. CHROMIUM, TOTAL 3. COPPER, TOTAL 4. LEAD, TOTAL * 5. MERCURY, TOTAL 6. NICKEL, TOTAL 7. ZINC, TOTAL	0.30 6.8 5.7 18 0.0084 6.5	0.020 0.50 1.0 0.50 0.0020 1.0 0.20

# BDL=BELOW DETECTION LIMIT

\*Lead analyzed by flame AAS because of concentration level found.

6) GROUNDWATER DATA



#### **ENVIRONMENTAL and INDUSTRIAL ANALYTICAL SERVICES**

November 1, 1984

Mr. Rocco Palazolo Engineering Sciences 57 Executive Park S. Atlanta, Georgia 30329

Re: Sample results for OW-1A, OW-1B, OW-2, OW-3, OW-4, OW-5, & OW-6.

#### Dear Rocco:

Enclosed please find additional copies of the reports for the above referenced samples. As we discussed, they were shipped to RECRA Environmental Laboratories for analysis, since we were unable to meet your turnaround time needs at the time.

Should you have any questions or comments, please do not hesitate to contact me at anytime.

Very truly yours,

H2M CORPORATION

Stanley C. Lewis
Operations Manager - Laboratory

SCL/jes Enclosure



		SAM	IPL II	v <i>6</i>		URES	IN FEET	907 2	BORING OW-I ; Nash Road Site
WELL SCHEMATICS	PL OW COUAT	PANPLE NO B TIPE	AUA AO	CORE PEC	CORE	FRACTURES	DEPTH !	GRAPHI	DESCRIPTIVE GEOLOGIC NOTES
		18,11					70-		TOP OF BEDROCK AT 68.6'. BEDROCK IS DOLOSTONE. BORING TERMINATED AT A DEPTH OF 68.6' ON JUNE 11. 1984.

#### SOIL SAMPLING INFORMATION

- M STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- M DISTURBED SAMPLE
- [] NO SAMPLE RECOVERED
- ROCE CORL INTOPMATION
- RO COPE LOSS ZONE - PLECENT CORE
- 87] COBL Bob

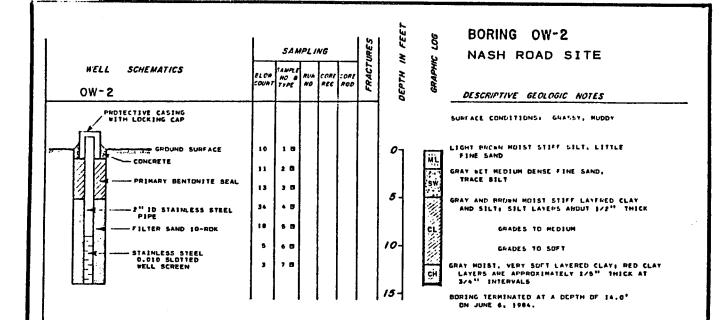
#### FRACTURES

- TTT Prine of core loss
- 正正 Brerria zone
- Dip-slip slirbonsides
- Mineralized fracture | c = calcite | s = sulfide | tractured zone fractures shown at approximate angle to core axis

  - Veld

#### FID TO WILL SCHEMATIC

- FFF Grout
- 222 Pentonite Scal
- Compand Filter
- 舞用 Well Screen



#### SOIL SAMILING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- & DISTURDED SAMPLE
- D NO SAMPLE RECOVERED
- POCY CORE INFORMATION CORE LOSS ZONE
- PERCENT CORE RECOVERY.
- 87 CORE POD

#### FRACTURES

TITE 2-ne of core loss 正在正正 Breccia tone - Dip-allp alichansides fractures shown at approximate angle to core axis

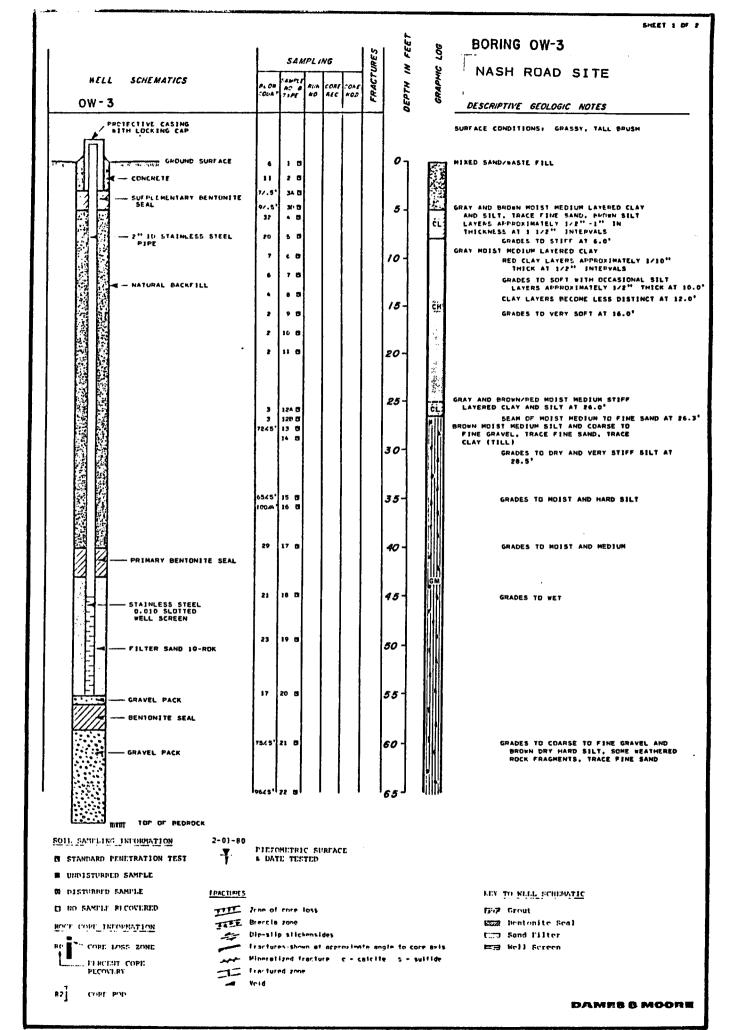
Minoralized fracture c - catclife s - suffide TE finitured rone - Veld

KLY TO WELL SCHEMATIC

FFF Grout

E22 Pentonite Scal till Sand Filter

⊨= Well Sereen



SAMPLING

SEMPLING

SAMPLING

SAMPLI

SOIL SAUPLING INFORMATION

T STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

M DISTURBLD SAMPLE

D NO SAMPLE RECOVERED

ROCE COST INCORNATION

FOR COST LOSS NOME

PECOVERY

CORL POR

82

FRACTURES

TTT Zenn of core loss

TATE Brencia zone

Olr-slip slichmaides

fractures shown at approximate angle to core axis.

Rineralized fracture c = calcite s = sulfide

I fractured some

KEY TO WELL SCHENATIC

BOWING TERMINATED AT A DEPTH OF 68.7° DN JUNE 7, 1984.

ting Grout

Hentonite Scal

t⊐ Sand Filter

□ Well Screen

SHEET 1 DF 2 FEET BORING **OW-4** 907 FRACTURES SAMPL ING NASH ROAD SITE 3 GRAPHIC WELL SCHEMATICS DEPTH ADD **OW-4** DESCRIPTIVE GEOLOGIC NOTES PROTECTIVE CASING SURFACE CONDITIONS: GRASSY, SOME SURFACE TRASM GROUND SURFACE 0-MIXED SAND/WASTE FILL 31 - CONCRETE SUPPLEMENTARY BENTONITE SEAL GRAY MOIST SILT AND CLAY ML 5 2 13 15 GRAY WET MEDIUM TO FINE SAND, TRACE SILT, OHGANIC DOOR, SOME BLACK STAIN şw 3 8 17 GRAY AND BROWN MOIST LAYERED SILT AND CLAY, TRACE FINE SAND 33 ::d 5 G 10 -2" ID STAINLESS STEEL PIPE 10 10-LAYERS APPROX. 1/2" THICK 16 GRADES TO WET BROWN SILT AND CLAY 8 9 5 15-3 GRADES TO CLAY. TRACE SILT NATURAL BACKFILL 20-2 11 0 25-12 0 2 13 6 30 2 2 14 🕾 35 BROWN WET SILT AND FINE TO COARSE SAND. LITTLE MEDIUM TO FINE GRAVEL 26 35 0 40-46 BROWN WET MEDIUM TO FINE SAND 45-50%.2 BROWN MOIST SILT, AND COARSE TO FINE SAND, LITTLE FINE TO COARSE SAND (TILL) 50 GRADES TO WET 80/.5 19 - PRIMARY BENTONITE SEAL GRADES TO MOIST 55 0/.5'20 B FILTER SAND 10-ROK 60 50/4121 @ STAINLESS STEEL 0.010 SLOTTED WELL SCREEN BENTONITE SEAL MFMT TOP OF BEDROCK BOIL SAMPLING INFORMATION KEY TO WELL SCHEMATIC

STANDARD PENETRATION TEST

tere Grout

UNDISTURNED SAMPLE

Pentonite Scal

R DISTURNED SAMPLE

Sand Filter

D NO SAMPLE RECOVERED

ı.	· · · · · · · · · · · · · · · · · · ·			<del></del>			
	WELL SCHEMATICS	SAMPLING  SAMPL ING  SAMPL RUE CORE CORE COURT TIPE NO REC NOD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG	BORING OW-4 NASH ROAD SITE	SHEET 2 OF 2
				70-	<u> </u>	TOP OF BEDROCK 70.3' BEDROCK 15 DOLDSTONE BURING TERMINATED AT A DEPTH OF 70.3'	
						DN JUNE 13, 1984.	

SOIL SAMPLING INFORMATION

STANDARD PENETRATION TEST

# UNDISTURNED SAMPLE

M DISTURPED SAMPLE

O NO SAMPLE RECOVERED

ROCY CORE INFORMATION

CORE LOSS ZONE

FERCINE COPE

PECOVERY

CASA BAD

82

FRACTIPES

TTT Icon of core loss

TAPE Brecele rone

Dip-slip stickensides
Fractures-shown at appro-

Frectures shown at approximate angle to rore exis

Wineralized fracture c = ratiofe s = suifide

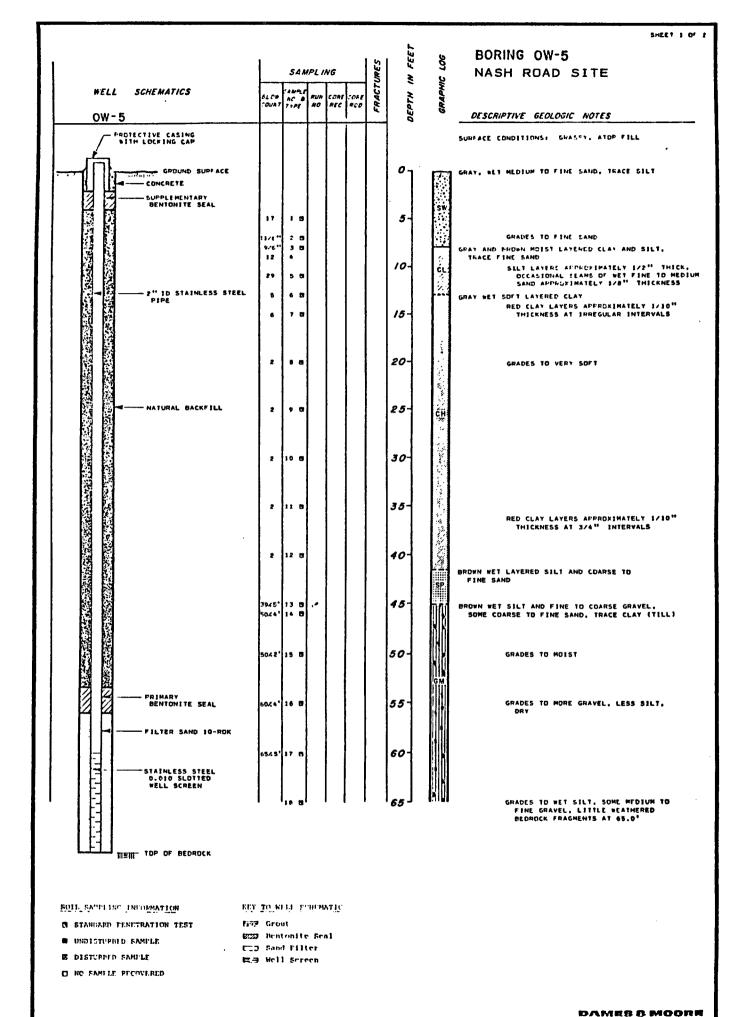
Fractured cone

KIN TO WILL SCHEWILL

Now Grout

E22 Bentonite Scal

四 Sand Filter 国 Well Screen



SHEET 2 0º # IN FEET **BORING OW-5** 99 NASH ROAD SITE SAMPLING DEPTH WELL SCHEMATICS CORE REC CORE DESCRIPTIVE GEOLOGIC NOTES TOP OF DOLOSTONE BEDROCK AT 49.8" BURING TERMINATED AT A DEPTH OF 70.0"

ON JUNE 14. 1984.

SOIL SAMPLING INFORMATION

S STANDARD PENETRATION TEST

m DHDISTURBED SAMPLE

# PISTURBED SAMPLE

D NO SAMPLE RECOVERED

CORT BAD

02

ROCT CORE INCOPMATION CORE LOSE ZONE

PERCENT CORE

PRACTURES

TITE Icae at care loss

THE Brentie some

Dip-allp allebonsides

fractures-shown at approximate engle to core exis Mineralized fracture c - calcite s - suffide

III fractured rome - 7010

KEY TO WELL SCHEMATIC

1222 Bentonite Seal

Fand Filter

■ Well Screen

SAMPLING

SAMPLI

#### BOIL SAMPLING INFORMATION

- 5 STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- B DISTURNED SAMPLE
- D NO SAMPLE RECOVERED
- ROCK CORE INFORMATION
- CORE LOSS ZONE
  PERCENT CORE
  RECOVERY
- 82 CORE POR

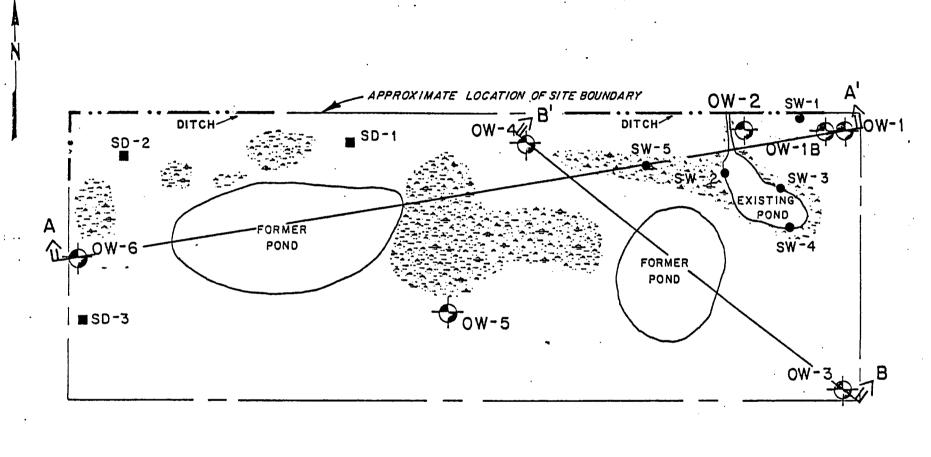
- PRACTURES
- TTT Zene of core loss
- TABL Breccie zone
  - Dip-ellp elichensides
    - Fractures shown at approximate angle to core exis

      Hineralized fracture c colcite s suifide
- Fractured zone
  - Vold

- KEY TO WELL SCHEPATIC
- 1373 Grout
- 2222 Bentonite Seal
- □□ Sand Filter
- 民国 Well Screen

9) SAMPLING LOCATION MAP

BY D. Tompe DATE 8/3/84



#### EXPLANATION:

- **SEDIMENT SAMPLE**
- SURFACE WATER SAMPLE
- SAMPLING WELL

NOTE | OSTERMAN WELL IS LOCATED APPROXIMATELY 1000 FEET WEST OF SITE.

PLOT PLAN
SHOWING CROSS SECTION LOCATIONS
NASH ROAD SITE

400 FEET

SCALE

10) PERMEABILITY TEST DATA

# Summary In-5; tu Permeabelity

Well	Permeability C	n/oc
0ω- <u>1</u>	4.37 ×10-4	silt
The second secon	6.75 × 10 -4	silt + sand
_0ω-1β	8.43 ×10 <sup>-7</sup>	1.11/bedrock
ow3	1,43 ×10-6	Wet zone in till
0w-4	7.88 *10-7	toll/bedrock
οω-5	7.5 +10-4	Hill/Bedrock
'0ω-6	4.8 × 10 +	All book rock

```
Janes Grand
  CALIBRATION DATA
Well 1 0W1
A±-5.6258E 01
9= 6.4516E-02
p= 0.0000E 00
J0= 272
T0= 81493
ET(sec)= 30
WELL DRAWDOWN
OW1 -2.96
ET(seo)= 61

WELL DRAWDOWN

OW1 5.71 -3.63
ET(sec)= 90
WELL DRAWDOWN
OW1 2.2 ( -4.27
ET(sec)= 121
WELL DRAWDOWN
 OW1 -4.88
 ET(sec)= 151
WELL DRAWDOWN
WELL DRAWDOWN

OW1 -5.22

ET(sec)= 180

WELL DRAWDOWN

OW1 -5.46
 ET(sec)= 211

WELL DRAWDOWN

OW1 1.032 -5.61
 ET(sec)= 241
WELL DRAWDOWN
OW1 (1) -5.76
  ET(sec)= 271
WELL DRAWDOWN
OW1 -5.87
  ET(sec)= 301
WELL DRAWDOWN
                  301
  OW1 ^.'' -5.93
  ET(sec)= 330
WELL DRAWDOWN
  OW1 -6.00
  ET(sec)= 361
WELL DRAWDOWN
OW1 -6.06
   ET(sec)= 390
WELL DRAWDOWN
   OW1 10.50 -6.12
   FT(sec)= 121
WELL DRAWDOWN
OW1 -6.19
```

```
ET(sec)= 421
WELL DRAWDOWN
OW1 -6.19
ET(sec)= 451
WELL DRAWDOWN
OW1 -6.19
ET(sec)= 481
WELL DRAWDOWN
OW1 -6.25
ET(sec)= 511
WELL DRAWDOWN
OW1 -6.32
ET(sec)= 540 ;
WELL DRAWDOWN
OW1 -6.32
ET(sec)= 571
WELL DRAWDOWN
OW1 -6.32
 ET(sec)= 600
WELL DRAWDOWN
 ом1 10 мгг −6.38

0,311
 ET(sec)= 631
WELL DRAWDOWN
OW1 -6.38
 ET(sec)= 661
WELL DRAWDOWN
OW1 -6.38
 ET(sec)= 690
WELL DRAWDOWN
OW1 -6.38
 ET(sec)= 721
WELL DRAWDOWN
OW1 -6.45
 E1(sec)= 751
WELL DRAWDOWN
OW1 -6.45
 ET(sec)= 781
WELL DRAWDOWN
OW1 -6.45
 ET(sec)= R11
WELL DRAWDOWN
OW1 -6.45
  ET(sec)= 841
WELL DRAWDOWN
0W1 -6.45
  ET(sec)= 871
WELL DRAWDOWN
OW1 -6.45
   ET(sec)= 901
WELL DRAWDOWN
   OW1 -6,49
```

ET(sec)= 930

```
ET(sec)= 930
WELL DRAWDOWN
OW1 -6.51
                      -6.51
        ET(sec)= 961
WELL DRAWDOWN
              -6.51
        OWI
       ET(sec)= 990
WELL DRAWDOWN
               -6.51
       OW 1
      ET(sec)= 1021
WELL DRAWDOWN
                -6.51
      OWI
     ET(sec)= 1051
WELL DRAWDDWN
      140
                     -6.51
     ET(sec)= 1080
WELL DRAWDOWN
     0M1
                     -6.51
     ET(sec)= 1110
WELL DRAWDOWN
                 -6.51
     1110
    ET(sec)= 1141
WELL DRAWDOWN
    OW1
                   -6.51
    ET(sec)= 1171
WELL DRAWDOWN
    OWI
                   -6.58
   ET(sec)= 1200
WELL DRAWDOWN
   OWI
                   -6.58
   ET(sec)= 1231
WELL DRAWDOWN
           -6.58
   OMI
  ET(sec)= 1261
WELL DRAWDOWN
  OWI
  ET(sec)= 1291
WELL DRAWDOWN
  WELL
 IWO
                 -6.58
 ET(sec)= 1320
WELL DRAWDOWN
 OMI
                -6.58
ET(sec)= 1350
WELL DRAWDOWN
            -6.58
ET(sec)= 1380
WELL DRAWDOWN
1 WO
               -6.58
ET(sec)= 1410
WELL DRAWDOWN
```

CW1

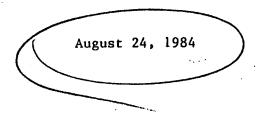
ET(sec)= 1441

-6.58



#### **RECRA ENVIRONMENTAL LABORATORIES**

Division of Recra Research, Inc. -



Mr. Stan Lewis H2M 575 Broadhallow Road Melville, NY 11747

Re: Analytical Results

Dear Mr. Lewis:

Please find enclosed results of the analyses of the samples received at our laboratories on July 30 and August 1, 1984.

If you have any questions concerning these data, do not hesitate to contact our Customer Service Representative at (716) 692-7620.

Sincerely,

RECRA ENVIRONMENTAL LABORATORIES

James A. Ploscyca Laboratory Manager

BJK/JAP/mdc/jhs Enclosure

> I.D. #84-746 84-746 A 84-746 B



Division of Recra Research, Inc.

# ANALYTICAL REPORT



## **RECRA ENVIRONMENTAL LABORATORIES**

Division of Recra Research, Inc.

#### ANALYTICAL RESULTS

H2M
PRIORITY POLLUTANT ANALYSES

#### Prepared For:

H2M 575 Broadhallow Road Melville, NY 11747

#### Prepared By:

Recra Environmental Laboratories 4248 Ridge Lea Road Amherst, NY 14226

#### Report Date:

August 24, 1984

#### ANALYTICAL RESULTS

# H2M PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

#### INTRODUCTION:

On July 30, and August 1, 1984 samples were received at Recra Environmental Laboratories. A request was made by H2M to have the samples analyzed for selected fractions of the Environmental Protection Agency decreed priority pollutants, total organic halide, and to determine the pH.

This report will address the results of those analyses.

#### **METHODS:**

Priority pollutant analyses were conducted according to Environmental Protection Agency (EPA) methodologies.

Organic priority pollutants were analyzed by Gas Chromatography/Mass Spectrometry (GC/MS).

#### RESULTS AND DISCUSSION:

Analysis for total organic halide was subcontracted. Sample FT-1 for total organic halide was not received.

Total organic halide values reported as "less than" (<) indicate the working detection limit for the given sample and/or parameter.

Sample OW-2 was analyzed in duplicate for the base neutral compounds but no positive values resulted.

Compounds reported as ND are "not detected". Compounds reported as BDL are confirmed as being present in the sample at a level "below detection limit", and are not subject to reliable quantitation.

Respectfully Submitted,

RECRA ENVIRONMENTAL LABORATORIES

Parhara I Praimaki



## ANALYTICAL RESULTS

# H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

	BASE/NEUTRALS SAMPLE IDENTIFICATION								
COMPOUND	DETECTION LIMIT (ug/l)	OW-1	OW-1B	OW-2					
acenaphthene	1.9	ND	ND	ND					
acenaphthylene	3.5	ND	ND	ND					
anthracene	1.9	ND	ND	ND					
benzidine	44	ND	ND	ND					
benzo(a)anthracene	7.8	ND	ND	ND					
benzo(a)pyrene	2.5	ND	ND	ND					
benzo(b)fluoranthene	4.8	ND	ND	ND					
benzo(g,h,i)perylene	4.1	ND	ND	ND ·					
benzo(k)fluoranthene	2.5	ND	ND	ND					
bis(2-chloroethoxy)methane	5.3	ND	ND	ND					
bis(2-chloroethyl)ether	5.7	ND	ND	ND ·					
bis(2-chloroisopropyl)ether	5.7	ND	ND	ND					
bis(2-ethylhexyl)phthalate	2.5	ND	ND	ND					
4-bromophenylphenylether	1.9	ND	ND !	ND					
butylbenzylphthalate	2.5	ND	ND	ND					
2-chloronaphthalene	1.9	ND	ND	ND					
4-chlorophenylphenylether	4.2	ND	ND ,	ND					
	2.5	ND	ND	ND					
chrysene	2.5	ND	ND	ND					
dihenzo(a, h)anthracene	1.9	ND	ND	ND					
1,2-dichlorobenzene	1.9	ND	ND	ND					
1,3-dichlorobenzene	4.4	ND	ND	ND					
1,4-dichlorobenzene	16.5	ND	ND ND	ND					
3,3'-dichlorobenzidine	22	ND	ND	ND					
diethylphthalate	1.6	ND	ND	ND					
dimethylphthalate	2.5	ND ·	<del> </del>	ND					
di-n-butylphthalate	1 2.3	1	*10						

(Continued)



RECRA ENVIRONMENTAL LABORATORIES

### H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

	SAMPLE IDENTIFICATION			
	DETECTION LIMIT	,		
COMPOUND	μg/1)	OW-1	OW-1B	OW-2
2,6-dinitrotoluene	1.9	ND	ND	ND
2,4-dinitrotoluene	5.7	ND	ND	ND
di-n-octylphthalate	2.5	ND	! ND	ND
1,2-diphenylhydrazine	25	ND	ND	ND
fluoranthene	2.2	ND	ND	ND
fluorene	1.9	ND	ND	ND
hexachlorobenzene	1.9	ND	ND	ND
nexachlorobutadiene	0.9	ND	ND	ND .
hexachlorocyclopentadiene	25	ND	' ND	ND
nexachloroethane	1.6	ND	i ND	ND
indeno(1,2,3-cd)pyrene	3.7	ND	ND	ND
Lsophorone	2.2	ND	ND	ND
naphthalene	1.6	ND	ND	ND
nitrobenzene	1.9	´ ND	ND	ND
N-nitrosodimethylamine	25 <sup>r</sup> .	ND	ND	ND
W-nitrosodi-n-propylamine	25	ND	ND	ND
N-nitrosodiphenylamine	1.9	ND	ND	ND
phenanthrene	5.4	ND	ND	ND
yrene	1.9	ND	ND	ND
1,2,4-trichlorobenzene	1.9	ND	ND	ND
		· · · · · · · · · · · · · · · · · · ·		<del></del>

DDITIONAL SAMPLE INFORMATION

Sample Date	7/2/84	7/3/84	7/3/84
Extraction Date	7/31/84	8/22/84	7/31/84
nalysis Date	8/14/84	8/23/84	8/15/84
internal Standard - Level	20 μg/1	20 μg/l	20 μg/l
deuterated phenanthrene - Recovery	102%	82%	130%
urrogate Standard (SS3) - Level	I20 μg/1	120 μg/1	120 µg/1
ecafluorobiphenyl - Recovery	54%	62%	65%
Surrogate Standard (SS4) - Level	100 μg/1	100 μg/l	100 µg/1
2-fluorobiphenyl - Recovery	61%	70%	63%

FOR RECRA ENVIRONMENTAL LABORATORIES Bulara & Capulai

# H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

		SAMPLE IDENTIFICATION		
	DETECTION LIMIT			
OMPOUND	(µg/1)	OW-3	OW-4	OW-5
cenaphthene	1.9	ND	ND	ND
acenaphthylene	3.5	ND	; ND	ND
nthracene	1.9	ND	ND	ND
benzidine	44	ND	ND	ND
enzo(a)anthracene	7.8	ND	ND	ND
denzo(a)pyrene	2.5	ND	ND	ND
enzo(b)fluoranthene	4.8	ND	ND	ND
enzo(g,h,i)perylene	4.1	ND	ND	ND
enzo(k)fluoranthene	2.5	ND	ND	ND
is(2-chloroethoxy)methane	5.3	ND	ND	ND
his(2-chloroethyl)ether	5.7	ND	ND	ND
is(2-chloroisopropy1)ether	5.7	ND	ND	ND
bis(2-ethylhexyl)phthalate	2.5	ND	ND	ND
-bromophenylphenylether	1.9	ND	ND	ND
butylbenzylphthalate	2.5	ND	· ND	ND
-chloronaphthalene	1.9	ND	ND	ND
4-chlorophenylphenylether	4.2	ND	ND	ND
hrysene	2.5	ND	ND ND	ND
ibenzo(a, h)anthracene	2.5	ND	ND	ND
4.2-dichlorobenzene	1.9	ND	ND	ND
3-dichlorobenzene	1.9	ND	ND	ND
1,4-dichlorobenzene	4.4	ND	ND	ND
3'-dichlorobenzidine	16.5	ND	ND	ND
diethylphthalate	22	ND	ND	ND
lmethylphthalate	1.6	· ND	ND	ND
di-n-butylphthalate	2.5	ND	, ND	ND

(Continued)



## H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

DASE/NEUTRALS					
		SAMPLE IDENTIFICATION			
	DETECTION				
COMPOUND	LIMIT (µg/1)	OW-3	OW-4	OW-5	
2,6-dinitrotoluene	1.9	ND	ND	ND	
2,4-dinitrotoluene	5.7	ND	ND	ND	
di-n-octylphthalate	2.5	ND	ND	ND	
1,2-diphenylhydrazine	25	ND	ND	ND	
fluoranthene	2.2	ND !	ND	ND	
fluorene	1.9	ND .	ND	ND	
hexachlorobenzene	1.9	ND	ND	ND	
hexachlorobutadiene	0.9	ND .	ND	ND	
hexachlorocyclopentadiene	25	ND ·	ND	ND	
hexachloroethane	1.6	ND :	ND	ND	
indeno(1,2,3-cd)pyrene	3.7	ND	ND	ND	
isophorone	2.2	ND	ND	ND	
naphthalene	1.6	ND	ND	ND	
nitrobenzene	1.9	ND	ND	ND	
N-nitrosodimethylamine	25`	ND	ND	ND	
N-nitrosodi-n-propylamine	25	ND	ND	ND	
N-nitrosodiphenylamine	1.9	ND	ND	ND	
phenanthrene	5.4	ND	ND	ND	
pyrene	1.9	ND	ND	ND	
1,2,4-trichlorobenzene	1.9	ND	ND	ND	
ADDITIONAL SAMPLE INFORMATION					
Sample Date		7/2/84	7/3/84	7/10/84	
Extraction Date		7/31/84	7/31/84	7/31/84	
Analysis Date		8/15/84	8/15/84	8/15/84	
Internal Standard - Level		20 μg/1	20 μg/l	20 μg/l	
deuterated phenanthrene - Rec	covery	110%	130%	135%	
Surrogate Standard (SS3) - Le		120 μg/1	120 μg/1	120 µg/1	
decafluorobiphenyl - Recovery	<u>,                                      </u>	65%	58%	59%	
Cummanana Chandana (CC/) T		100 vg/1	100 119/1	100 10/1	

FOR RECRA ENVIRONMENTAL LABORATORIES by

Gartara Strajouslu 8/24/84

100 μg/l

47%

100 μg/l

45%

DATE

100 μg/l

56%

Surrogate Standard (SS4) - Level

2-fluorobiphenyl - Recovery

# H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

BASE/NEUTRALS SAMPLE IDENTIFICATION				
DETECTION LIMIT (ug/1)	OW-6	OSTERMAN WELL	FT-1	
1.9	ND	ND	ND	
3.5	ND	ND	ND	
1.9	ND	ND	ND .	
44	ND	ND	ND	
7.8	ND	ND	ND	
2.5	ND	ND	ND	
4.8	ND	ND .	ND ·	
4.1	ND	ND	ND .	
2.5	ND	ND	ND	
5.3	ND	ND	ND	
5.7	ND	ND	ND	
5.7	ND	ND	ND	
2.5	ND	ND	ND	
1.9~	ND	ND	ND	
2.5	ND ·	ND	ND	
1.9	ND :	ND ·	ND	
4.2	ND	ND	ND	
2.5	ND	ND	ND	
2.5	ND	ND	ND	
1.9	ND	ND	ND	
1.9	ND	ND	ND	
4.4	ND	ND	ND	
16.5	ND	ND	ND	
22	ND	ND	ND	
1.6	ND	ND	ND	
2.5	ND	ND	ND ·	
	DETECTION LIMIT (µg/1) 1.9 3.5 1.9 44 7.8 2.5 4.8 4.1 2.5 5.3 5.7 5.7 2.5 1.9 2.5 1.9 4.2 2.5 2.5 1.9 4.2 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2	DETECTION LIMIT (µg/1) OW-6  1.9 ND  3.5 ND 1.9 ND  44 ND  7.8 ND  4.8 ND  4.1 ND  2.5 ND  5.3 ND  5.7 ND  5.7 ND  1.9 ND  2.5 ND  1.9 ND  4.2 ND  1.9 ND  4.2 ND  1.9 ND  4.2 ND  1.9 ND  4.2 ND  1.9 ND	SAMPLE IDENTIFICA	





TECHA FINIROHMENTAL LABORATORIES

### H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

	BASE/NEUTRALS SAMPLE IDENTIFICATION			
COMPOUND	DETECTION LIMIT (µg/1)	OW-6	OSTERMAN WELL	FT-1
2,6-dinitrotoluene	1.9	ND	ND	ND
2,4-dinitrotoluene	5.7	ND	ND	ND
di-n-octylphthalate	2.5	ND	ND	ND
1,2-diphenylhydrazine	25	ND	ND	ND
fluoranthene	2.2	ND	ND	ND
fluorene	1.9	ND	ND	ND
hexachlorobenzene	1.9	ND	ND	ND
hexachlorobutadiene	0.9	ND	: ND	ND
hexachlorocyclopentadiene	25	ND	ND	ND
hexachloroethane	1.6	ND	ND	ND
indeno(1,2,3-cd)pyrene	3.7	ND	ND	ND
	2.2	ND	ND !	ND
isophorone	1.6	ND	ND	ND
naphthalene	1.9	ND	ND	ND
nitrobenzene	257	ND	ND	ND
N-nitrosodimethylamine	25	ND	ND	ND
N-nitrosodi-n-propylamine	1.9	ND	ND	ND
N-nitrosodiphenylamine		ND	ND ·	ND ND
phenanthrene	5.4		ND	ND
pyrene	1.9	ND		
1,2,4-trichlorobenzene	1.9	ND	ND	ND

ADDITIONAL SAMPLE INFORMATION			<u>.</u>
Sample Date	7/10/84	7/11/84	7/3/84
Extraction Date	7/31/84	7/31/84	7/31/84
Analysis Date	8/15/84	8/15/84 :	8/15/84
Internal Standard - Level	20 μg/1	20 μg/l	20 μg/l
deuterated phenanthrene - Recovery	130%	78%	1 35%
Surrogate Standard (SS3) - Level	120 µg/1	120 μg/1	120 μg/1
decafluorobiphenyl - Recovery	71%	50%	64%
Surrogate Standard (SS4) - Level	100 μg/1	100 μg/l	100 μg/1
2-fluorobiphenyl - Recovery	63%	52%	55%

FOR RECRA ENVIRONMENTAL LABORATORIES <u>Julaia</u> | Kuyeuskii

DATE 8/24/84

ABORATORIES

RA ENVIRONMENTAL LABORATORIES

### H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

VOLATILES

VOLATILES SAMPLE IDENTIFICATION					
	DETECTION		JAMES IDENTIFICAT	TON	
COMPOUND	LIMIT (µg/1)	OW-1	OW-1B	OW-2	
acrolein	400	ND	ND	ND ·	
acrylonitrile	400				
benzene		ND	ND	ND	
	4.4	ND	ND	עא	
bromodichloromethane	2.2	ND	ND	ND ND	
bromoform	4.7	ND ND	ND	ND	
bromomethane	10	ND	ND	ND	
carbon tetrachloride	2.8	ND	ND · ·	ND	
chlorobenzene	6.0	ND	ND	ND ND	
chloroethane	10	ND	ND .	ND	
2-chloroethylvinyl ether	10	ND	ND	ND	
chloroform	1.6	ND	ND	ND	
chloromethane	10	ND	ND	ND	
dibromochloromethane	3.1	ND	ND	ND	
1,1-dichloroethane	4.7-	ND	ND	ND	
1,2-dichloroethane	2.8	ND	ND	ND	
l,1-dichloroethylene	2.8	ND	ND	ND	
trans-1,2-dichloroethylene	1.6	ND	ND	ND '	
1,2-dichloropropane	6.0	ND .	ND	ND '	
1,3-dichloropropene	5.0	ND_	ND ND	ND	
ethylbenzene	7.2	ND	ND	ND ·	
methylene chloride	2.8	ND	ND	ND	
1,1,2,2-tetrachloroethane	6.9	ND	ND	ND	
tetrachloroethylene	4.1	ND	, ND	ND :	

(Continued)



### H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

VOLATILES

:.		SAMPLE IDENTIFICATION			
COMPOUND	DETECTION · LIMÍT (μg/1)	OW-1	OW-1B	OW-2	
toluene	6.0	ND	ND	ND	
1,1,1-trichloroethane	3.8	ND	BDL	ND	
1,1,2-trichloroethane	5.0	ND	ND	ND	
trichloroethylene	1.9	ND	ND	ND	
vinyl chloride	10	ND	ND	ND	

ADDITIONAL SAMPLE INFORMATION

Sample Date		· · · · · · · · · · · · · · · · · · ·	
	7/2/84	7/3/84 '	7/3/84
Analysis Date	8/13/84	8/13/84	8/13/84
Internal Standard - Level	40 μg/l	40 µg/l	40 μg/1
bromochloromethane - Recovery	99%	120%	96%
Internal Standard - Level	40 µg/l	40 μg/l	40 μg/1
2-bromo-1-chloropropane - Recovery	99%	110%	96%
Internal Standard - Level	40 μg/1	40 µg/l	40 μg/1
1,4-dichlorobutane - Recovery	99%	120%	100%

FOR RECRA ENVIRONMENTAL LABORATORIES Balara & Kapudii

# H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

### VOLATILES

<u> </u>		TI I I I I I I I I I I I I I I I I I I		
	SAMPLE IDENTIFICATION			
	DETECTION LIMIT		1	
COMPOUND	μg/1)	OW-3	OW-4	OW-5
acrolein	400	ND .	ND	ND
acrylonitrile	400	· · ND	ND	ND
benzene	4.4	ND	ND	ND
bromodichloromethane	2.2	ND	ND	ND
bromoform	4.7	ND	ND	ND
bromomethane	10	ND	ND	ND
carbon tetrachloride	2.8	ND	ND	ND
chlorobenzene	6.0	ND	ND	ND
chloroethane	10	ND	ND	ND
2-chloroethylvinyl ether	10	ND	ND	ND
chloroform	1.6	ND	ND	ND
chloromethane	10	ND	ND	ND
dibromochloromethane	3.1	ND	ND	ND
1,1-dichloroethane	4.70	ND .	ND	ND
1,2-dichloroethane	2.8	ND	ND	ND
1,1-dichloroethylene	2.8	ND	ND	ND
trans-1,2-dichloroethylene	1.6	ND	ND	ND
1,2-dichloropropane	6.0	ND	ND	ND
1,3-dichloropropene	5.0	ND	ND	ND .
ethylbenzene	7.2	ND	ND	ND
methylene chloride	2.8	ND	ND	ND
1,1,2,2-tetrachloroethane	6.9	ND	ND	ND
tetrachloroethylene	4.1	ND	ND	ND

(Continued)



RA ENVIRONMENTAL LABORATORIES

### ANALYTICAL RESULTS ...

## H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

### VOLATILES

. :		SAMPLE IDENTIFICATION			
COMPOUND	DETECTION LIMIT (µg/1)	OW-3	OW-4	OW-5	
toluene	6.0	ND	ND	ND	
1,1,1-trichloroethane	3.8	ND	ND	ND	
1,1,2-trichloroethane	5.0	ND	ND	ND	
trichloroethylene	1.9	ND	ND	ND	
vinyl chloride	10	ND	ND	ND	

ADDITIONAL SAMPLE INFORMATION

Sample Date	7/2/84	7/3/84	7/10/84
Analysis Date	8/13/84	8/13/84	8/10/84
Internal Standard - Level	40 μg/l	40 μg/l	40 µg/1
bromochloromethane - Recovery	120%	97%	99%
Internal Standard - Level	40 μg/1	40 μg/l	40 μg/l
2-bromo-1-chloropropane - Recovery	130%	97%	90%
Internal Standard - Level	40 μg/l	40 μg/l	40 μg/l
1,4-dichlorobutane - Recovery	130%	100%	85%

FOR RECRA ENVIRONMENTAL LABORATORIES <u>Laboratories</u>

DATE

DAIL



# H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

VOLATILES

		SAMPLE IDENTIFICATION							
COMPOUND	DETECTION LIMIT (ug/1)	OW-6	OSTERMAN WELL	FT-1					
acrolein	400	ND	ND	ND					
a_acrylonitrile	400	ND	ND	ND					
benzene	4.4	ND	ND	ND					
bromodichloromethane	2.2	ND	ND	ND					
bromoform	4.7	ND	ND	ND					
bromomethane	10	ND	ND	ND					
carbon tetrachloride	2.8	ND	ND ND	ND					
chlorobenzene	6.0	ND	ND	ND					
chloroethane	10	ND	ND ND	ND .					
2-chloroethylvinyl ether	10	ND	ND ·	ND					
chloroform	1.6	ND	ND	ND					
chloromethane	10	ND	ND	ND					
dibromochloromethane	3.1	ND	ND	: ND					
l,l-dichloroethane	4.7	ND	ND	ND					
1,2-dichloroethane	2.8	ND	ND	ND					
l,l-dichloroethylene	2.8	ND ·	ND	ND					
trans-1,2-dichloroethylene	1.6	ND ;	ND	ND					
1,2-dichloropropane	6.0	ND	ND	ND					
1,3-dichloropropene	5.0	ND	ND	ND					
ethylbenzene	7.2	ND	ND	ND					
methylene chloride	2.8	15 µg/1	ND ·	ND					
1,1,2,2-tetrachloroethane	6.9	ND	· ND	ND					
etrachloroethylene	4.1	ND :	ND	ND '					

(Continued)



NA ENVIRONMENTAL LABORATORIES

### H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

**VOLATILES** 

	SAMPLE IDENTIFICATION										
The state of the s	DETECTION LIMIT	•	OSTERMAN								
COMPOUND	(ug/1)	OW-6	WELL	FT-1							
toluene	6.0	ND	BDL	ND							
1,1,1-trichloroethane	3.8	ND	ND	ND .							
1,1,2-trichloroethane	5.0	ND	ND	ND							
trichloroethylene	1.9	ND	ND	ND							
vinyl chloride	10	ND	ND	ND							

ADDITIONAL SAMPLE INFORMATION

7/10/84	7/11/84	7/3/84
		8/10/84
40 μg/1	40 ug/1	40 ug/1
94%	98%	89%
40 µg/1	40 µg/1	40 µg/l
99%	95%	77%
40 μg/1	40 µg/1	40 ug/1
97%	96%	84%
	94% 40 µg/1 99% 40 µg/1	8/10/84 8/10/84 40 µg/1 40 µg/1 94% 98% 40 µg/1 40 µg/1 99% 95% 40 µg/1 40 µg/1

FOR RECRA ENVIRONMENTAL LABORATORIES

H2M

Report Date: 8/24/84

	·	PARAMETER (UNITS OF MEASURE)
SAMPLE IDENTIFICATION	SAMPLE DATE	TOTAL ORGANIC HALIDE (mg/1)
OW-1	7/2/84	<0.02
OW-1B	7/3/84	<0.02
OW-2	7/3/84	0.04
OW-3	7/2/84	0.04
OW-4	7/3/84	0.09
OW-5	7/10/84	<0.02
OW-6	7/10/84	0.12
Osterman Well	7/11/84	0.04

FOR RECRA ENVIRONMENTAL LABORATORIES \_\_\_

8/24/84

DATE

H2M

Report Date: 8/24/84

		PARAMETER (UNITS OF MEASURE)
SAMPLE IDENTIFICATION	SAMPLE DATE	pH (STANDARD UNITS)
OW-1	7/2/84	8.05
OW-1B	7/3/84	8.14
OW-2	7/3/84	8.12
OW-3	7/2/84	8.11
OW-4	7/3/84	8.14
OW-5	7/10/84	8.16
OW-6	7/10/84	8.07
FT-1	7/3/84	6.45
Osterman Well	7/11/84	8.20

FOR	RECRA	ENVIRONMENTAL LABORATORIES	RAS	Per	Richard	V Finn	
1:	•	DATE	8/2	4/34			

## GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES QUALITY CONTROL

Report Date: 8/24/84

BASE NEUTRAL RECOVERY ANALYSIS OF \*METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
1,3-dichlorobenzene	50	25	50
di-n-octylphthalate	50	36	72
fluoranthene	<sup>-</sup> 50	20	40
naphthalene	50	31	62
nitrobenzene	50	31	··· 62

ADDITIONAL SAFFLE INFORMATION	
Extraction Date	7/31/84
Analysis Date	8/14/84
Internal Standard (IS) - Level	20 μg/1
deuterated phenanthrene - Recovery	140%
Surrogate Standard (SS3) - Level	120 μg/1
Decafluorobiphenyl - Recovery	61%
Surrogate Standard (SS4) - Level	100 μg/1
2-fluorobiphenyl - Recovery	50%

FOR RECRA ENVIRONMENTAL LABORATORIES Langua & Kujewski

### H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES QUALITY CONTROL

Report Date: 8/24/84

### VOLATILE RECOVERY ANALYSIS OF · SAMPLE OW-3

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY		
carbon tetrachloride	200	120	60		
chlorobenzene	200	160	80		
chloroethyl vinyl ether	· 200	180	90		
chloroform	200	160	80		
dibromochloromethane	200	110	55		
1,1-dichloroethane	200	180	90		
1,1-dichloroethylene	200	170	85		
1,2-dichloropropane	200	170	85		
methylene chloride	200	140	70		
tetrachloroethylene	200	180	80		
1,1,2-trichloroethane	200	170	85		
trichloroethylene	200	160	80		

ADDITIONAL SAMPLE INFORMATION	
Sample Date	7/2/84
Analysis Date	8/13/84
Internal Standard - Level	40 µg/1
Bromochloromethane - Recovery	120%
Internal Standard - Level	40 μg/l
2-bromo-1-chloropropane - Recovery	130%
Internal Standard - Level	40 μg/l
1,4-dichlrobutane - Recovery	130%

FOR RECRA ENVIRONMENTAL LABORATORIES Julias | Kajeudii

DATE 8/24/84

VIRONMENTAL LABORATORIES

CHAIN OF CUSTODY RECORD PROJ. NO. PROJECT NAME 13305 his h Koad Site (Niccoras 003 SAMPLERS: (Signature) REMARKS CON-TAINERS STATION LOCATION TIME STA. NO. DATE In cooler Damosa Moore ٠,.. Relinquished by: (Signature) Date / Time Relinquished by: [Signature] Date / Time | Received by://\$ignature/ 7-5 Received by: Isignature! Date / Time Received by: Istmonel Refinguished by: (Siene West Received by: (Signatural Relinquished by: (Signature) Date / Time Remarks Relinquished by: (Signature) Received for Laboratory by: Date / Time

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PROJ. NO. PROJECT NAME 13305-200 NO. SAMPLERS: (Signature) REMARKS CON-TAINERS **STATION LOCATION** TIME STA. NO. DATE 8 In expler IV Relinquished by: (Signature) Date / Time | Recilived by: Isignatural 7-5 Relinquished by: (Signature) Date / Time Received by: ISignature! Refinquished by: (Signature) Reseived by: ISignatures Date / Time Relinquished by: (Signature) Date / Time AReceived by: Isignature Relinquished by: (Signature) Received for Laboratory by: Date / Time Remarks Date / Time [Signature] Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

PROJECT NAME PROJ. NO. 13305-NO. EDO SAMPLERS: (Signature) REMARKS TAINERS STATION LOCATION TIME STA, NO. In proper I Relinquished by: (Signatural Date / Time Received by: (Signature) Relinquished by: (Signature) Date ATime Received by: Signatural 7-5 Received by: Isignature! Date / Time Relinquished by: (Signature) Relinquished by: [Signeture] Received by: Isignatural Date / Time Received for Laboratory by: Date / Time Remarks Relinquished by: (Signeture) [Signature] Distribution: Original Accompanies Shipmoni; Copy to Coordinator Field Files

CHAIN OF CUSTODY RECORD & PROJ. NO. PROJECT NAME 13305-003 NO. SAMPLERS: (Signature) OF CON-TAINERS STATION LOCATION TIME STA. NO. In cooler BROKEN Relinquished by: (Signature) Date / Time Received by: (Signature) Relinquished by: (Signeture) . Date / Time Date / Time Date / Time Relinquished by: /Signaturel Received by: Isignowed Relinquished by: (Signarul) Received by: ISignaturel Remarks Relinquished by: (Signeture) Date / Time Received for Laboratory by: Date / Time [Signoture]

Distribution: Original Accomposites Shipment; Copy to Coordinator Field Files

CHAIN OF CUSTOUT RECORD PROJECT NAME PROJ. NO. 12305. 003 NO. SAMPLERS: (Signature) OF CON-TAINERS TIME STATION LOCATION STA. NO. DATE 0W-6 In cooler VII DO. NOT TEST UNLESS MOORE SEAL IS LABEL NOT BLOKEN Date / Time | Received by: Isignatural 7 1484 Relinquished by: [Signature] Relinquished by: [Signature] Date / Time Received by: ISignature) Reliequished by: (Signestere) Date / Time Received by: (Signature) Relinquished by: (Signatura) Date / Time 1 Received by: (Signature) Date / Time Received for Laboratory by: Date / Time Remarks Relinquished by: (Signature) ISian eture! Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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PROJECT NAME NO. SAMPLERS: (Signature) REMARKS CON-TAINERS STATION LOCATION STA. NO. Date / Time | Received by: Isignatural 7-5 Relinquished by: (Signature) Relinquished by: (Signature) Date / Time Received by: Isignature! Relinquished by (Signature) Date / Time Received by: Isignature! Received by: (Signature) Date / Time Relinguished by: (Signature) Date / Time Received for Laboratory by: Remarks Relinquished by: (Signature) Date / Time (Signature)

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

7) SURFACE WATER DATA

## Engineering-science LABORATORY ANALYSIS REPORT

He: 7/15/83 SOB: NAH ROAD-PHASE I BNUMBLE: 36330

mae 10. Pive samples received 7/1/83 for volatile organics, total organics helosons and pt) analysis

				•	
Parameter / sample 10	SW-1	2M-5	SW-3	5W4	SW-F
			10	<b>L10</b>	410
Tretnyline Chloride (ug/L)		410	I		
-Chloroform (us/L)	410	210	210	410	410
Earlin tetrachloride (ug/L)	<b>410</b>	710	410	210	,210.
Benzere (ug/L)	<b>&lt;10</b>	<10 ·	<b>LID</b> .	<10	410
Tolubre (ug/L)	410	410	410	410	410
alrovensine (49/L)	<b>LIO</b>	<10	410	410	410
■1.1.2-TDisPlanetrase(16/4)	<b>LIO</b>	<b>410</b>	410	<b>LIO</b>	<10
1,1,2-Tricklowetrase(18/4) Tetracklowetrene (18/1)	<b>LID</b>	410	410	410	410
1,1,2,2-Tetrachloroetrans	210	410	<10 ·	410	410
trick love there (us/L)	<b>L10</b>	<10	410	410	<10
trichlorethere (us/L) and reichborethere (sorrete)	410	410	410	LID.	410
Dicherobenzine sones	<b>LID</b>	410	410	Z10 '	210
- Hexachloroputatione (nost)	410	410	210	<b>∠10</b>	410
1 5 1 (5 ll)	6.9	8.1	7.1	7.4	7.4
Total Organic halogns(ppn)	0.010	0.005	0.007	0.007	0.008
<b>■■</b>	<del>-</del> .	•	-		, ,

B.L. Thorpe Latinatory Superusor

lanette M. Davis

## DAYAMMAH LABUKATUKILS AND ENVIRONMENTAL SERVICES, INC.

P.O. Box 13842 • Savannah, Ga. 31406 912/354-7858



### REPORT OF ANALYSIS

B. L. Thorpe Engineering-Science 57 Executive Park South, NE Suite 590 Atlanta, GA. 30329

REPORT NO.

DATE RECEIVED

SAMPLED BY

Client

DENTIFICATION: Samples submitted to laboratory

EPA Methods of Analysis (Model 610/0.I. Corp.)

SAMPLE ID.	<u>#</u>	•	TOX CONTENT	(ppm)
07-1000-01		•	0.010	
07-1001-01	;	!	0.005	
07-1002-01		•	0.007	
07-1003-01	;	į	0.007	
07-1004-01	٠.		U UUS '	

Janette M. Davis

8) BORING LOGS

ET(sec)= 1380 WELL DRAWDOWN

LWO

-6.58

ET(sec)= 1410 WELL DRAWDOWN

OW1

-6.58

ET(sec)= 1441 WELL DRAWDOWN

0W 1

-6.58

ET(sec)= 1471 WELL DRAWDOWN OW1 -6.58

ET(sec)= 1500 WELL DRAWDOWN OW1 -6.58

ET(sec)= 1530 WELL DRAWDOWN

OWI

-6.58

ET(sec)= 1561 WELL DRAWDDWN

-6.58

ET(sec)= 1591 WELL DRAWDOWN

OWI

-6.59

ET(sec)= 1621 WELL DRAWDOWN

1MO

-6.62

ET(sec)= 1651 WELL DRAWDOWN -6.62

OWI

ET(sec)= 1681 WELL DRAWDOWN DW1 -6.64

ET(sec)= 1711
WELL DRAWDOWN

OW1 -6.64

ET(sec)= 1741
WELL BRAWDOWN

OW1

-6.64

ET(sec)= 1771 WELL DRAWDOWN

1 WO

-6,64

ET(sec)= 1800 WELL DRAWDOWN

OWI

-6.64

ET(sec)= 1830 WELL DRAWDOWN

VIXX 9.6 Well 1 0W1B A=-5.6923E 01 B= 6.5279E-02 D= 0.0000E 00 a diament J0= 273 T0= 62293 ET(sec)= 121 WELL DRAWDOWN -1.76 OMIB ET(sec)= 180 WELL DRAWDOWN OWIB -1.89 ET(sec)= 241 WELL DRAWDOWN -1.95 BINO ET(sec)= 301 0= 301 DRAWDOWN 3 1 3 -2.08 5,7 WELL OWIB ET(sec)= 361 WELL DRAWDOWN -2.19 BINO ET(sec)= 420 DRAWDOWN BINO -2.28 ET(sec)= 481 WELL DRAWDOWN OWIB -2.35 ET(sec)= 541 WELL DRAWDOWN -2.48 OMIB ET(sec)= 601 10,000 WELL DRAWDOWN
OWIB -2.54 OM1B ET(sec)= 661 WELL DRAWDOWN -2.61 OMIB ET(sec)= 721 WELL DRAWDOWN -2.74 OMIB ET(sec)= 780 WELL DRAWDOWN -2.80 OMIB ET(sec)= 840 WELL DRAWDOWN -2.87 BINO

FI(sec)= 900 WELL DRAWDOWN

```
WLLL
          DESCRIPTION
  OWIB -2.87

ET(sec)= 900 \(\frac{1}{2} \right|^{2^{1/2}} \)
         -2.93
  OW1B
  EI(sec)= 960
WELL DRAWDOWN
  OWIB
                -3.00
  ET(sec)= 1021
WELL DRAWDOWN
              -3.06
  OM1B
  ET(sec)= 1081
WELL DRAWDOWN
  OW18 -3.17
  ET(sec)= 1141
WELL DRAWDOWN
  OWIB -3.26
  ET(sec)= 1200 3<sup>()</sup>q<sup>1)''</sup>
WELL DRAWDOWN
OW1B -3.32
  ET(sec)= 1261
WELL DRAWDOWN
  OW1B -3.39
  ET(sec)= 1321
WELL DRAWDOWN
  OW1B -3.45
  ET(sec)= 1381
WELL DRAWDOWN
  OW18 -3.52
  ET(sec)= 1440
WELL DRAWDOWN
  OW1B -3.59

ET(sec)= 1500 ) / 10 ) | DRAWDOWN
  OW1B -3.65
  ET(sec)= 1561
WELL DRAWDOWN
  OW18 -3.72
  ET(sec)= 1621
WELL DRAWDOWN
  OW1B -3.78
  ET(sec)= 1681
WELL DRAWDOWN
         -3.85
   OW1B
  ET(sec)= 1741
WELL DRAWDOWN
  OW1B -3.91

ET(sec)= 1800 N) 2 1
   OWIB ', -3.98
   FT(sec)= 1861
   WELL DRAWDOWN
```

-4.01

OWIB

L L LUC WELL DRAWDOWN

-4.17 OW1B

ET(sec)= 2041 WELL DRAWDOWN

.... in an effection but a design with a Sales

OWIB -4.24

ET(sec)= 2101 - (...)
WELL DRAWDOWN

OWIB 34' '-4.33

ET(sec)= 2161 WELL DRAWDOWN

OWIB

-4.43

ET(sec)= 2220 WELL DRAWDOWN ,

OMIB

-4.46

ET(sec)= 2280 WELL DRAWDOWN

OWIB

-4.56

ET(sec)= 2348
WELL DRAWDOWN
OWIB -4.56
ET(sec)= 2400
DRAWDOWN

OMIB

-4.65

ET(sec)= 2461 WELL DRAWDOWN

OW18

-4.70

ET(sec)= 2520 WELL DRAWDOWN

OMIB

-4*.7*6

ET(sec)= 2580 WELL DRAWDOWN

OWIB

-4.83

ET(sec)= 2640 WELL DRAWDOWN

OWIB

-4.89

ET(sec)= 2701 WELL DRAWDOWN

OWIB

-4.96

ET(sec)= 2761 WELL DRAWDOWN

OMIB

-5.02

ET(sec)= 2821 WELL DRAWDOWN

OM1B

-5,09

ET(sec)= 2880 WELL DRAWDOWN ET(sec)= 2/61 WELL DRAWDOWN -5.02 GNIB ET(sec)= 2821 WELL DRAWDOWN

ET(sec)= 2880 WELL DRAWDOWN

OWIB

-5.09

-5.15 OWIB

ET(sec)= 2941 WELL DRAWDOWN

OWIB -5.22

ET(sec)= 3001
MELL DRAWDOWN

OW18 4.1. -5.28

ET(sec)= 3061 WELL DRAWDOWN

-5.35 OWIB

ET(sec)= 3121 WELL DRAWDOWN WELL

-5.41 OM1B

ET(sec)= 3181 WELL DRAWDOWN

-5.46 0W18

ET(sec)= 3240 WELL DRAWDOWN

-5.48 OWIB

ET(sec)= 3390 WELL DRAWDOWN

\,\'-5.54 OMIB

ET(sec)= 3361 WELL DRAWDOWN

-5.61 OMIB

March . The

ET(sec)= 1370 Ø WELL DRAWDOWN OW2 -3.05

ET(sec)= 1396 WELL DRAWDOWN

OW2

-2,85

ET(sec)= 1422 WELL DRAWDOWN

0W2

-2.69

ET(sec)= 1449 WELL DRAWDOWN 

0W2

ET(sec)= 1475 WELL DRAWDOWN OW2 -2.31

ET(sec)= 1501 WELL DRAWDOWN

OW2 -2.11

ET(sec)= 1527 WELL DRAWDOWN

OW2

-1.96

ET(sec)= 1554 WELL DRAWDOWN

OW2

-1.78

ET(sec)= 1580 WELL DRAWDOWN

OW2

-1.58

ET(sec)= 1606 WELL DRAWDOWN

OW2

ET(sec)= 1633 WELL DRAWDOWN OW2 -1.24 J0= 273 T0= 59355

ET(sec)= 16 WELL DRAWDOWN

OW2 -0.52

ET(sec)= 42 WELL DRAWDOWN

OW2 -0.57

EI(sec)= 68 MELL DRAWDOWN

OW2 -0.57

FT(sec)= 94 WELL DROWDOWN OW2 -1.15

```
WELL DRAWDOWN
ОW2 -1.15
ET(sec)= 119
WELL DRAWDOWN
OW2 '00 ' -1.73
FT(sec)= 145
WELL DRAWDOWN
______ БКНИЦЦИЙ
0W2 -2.33
ET(sec)= 171
WELL DRAWDOWN
OW2 4. -2.91
ET(sec)= 196
WELL DRAWDOWN
DW2 -3.51

ET(sec)= 222

WELL DRAWDOWN

OW2 -4.12
ET(sec)= 248
WELL DRAWDOWN
OW2 -4.72
 ET(sec)= 273
WELL DRAWDOWN
OW2 : -5.25
 ET(sec)= 299
WELL DRAWDOWN
 OW2 -5.65
ET(sec)= 325
WELL DRAWDOWN
OW2 -5.99
ET(sec)= 351
WELL DRAWDOWN

OW2 -6.28

ET(sec)= 377
WELL DRAWDOWN

OW2 -6.52
 ET(sec)= 403
WELL DRAWDOWN
       -6.72
 0W2
 ET(sec)= 429
WELL DRAWDOWN
OW2 -6.86
 ET(sec)= 455
WELL DRAWDOWN
 OW2 -7.01
  ET(sec)= .481
 WELL DRAWDOWN

OW2 -7.12
  ET(sec)= 507
WELL DRAWDOWN
  OW2 -7.26
```

ET(sec)= 533 WELL DROWDOWN

WELL DKHWDDNG OW2 -7.26 Ef(sec)= 533 WELL DRAWDOWN --7.32 0W2 ET(sec)= 560 WELL DRAWDOWN -7.3<del>9</del> 0W2 ET(sec)= 586 WELL DRAWDOWN -7.46 0W2 ET(sec)= 612 WELL DRAWDOWN 0W2 ', -2.50 EI(sec)= 638 WELL DRAWDOWN -2.52 0W2 ET(sec)= 665 WELL DRAWDOWN -7.59 0W2 ET(sec)= 691 WELL DRAWDOWN OW2 -7.59 ET(sec)= 717 WELL DRAWDOWN -2.66 0W2 ET(sec)= 743 WELL DRAWDOWN OW2 -7.66 ET(sec)= 769 WELL DRAWDOWN OW2 -7.66 EI(sec)= 796 WELL DRAWDOWN -7.70 0W2 ET(sec)= 822 WELL DRAWDOWN -7.72 0W2 ET(sec)= 848 WELL DRAWDOWN -7.72 0W2 ET(sec)= 874 WELL DRAWDOWN -7.7**2** OW2 ET(sec)= 900 WELL DRAWDOWN -7.72 OW2 ET(sec)= 926 WELL DRAWDOWN DW2 ( -7.79

ET(sec)= 952 WELL DRAWDOWN 0W2 -2.79

0W2

-7.70

ET(sec)= 822 WELL DRAWDOWN

0W2

-7.72

ET(sec)= 848 WELL DRAWDOWN

0W2

-7.72

ET(sec)= 874 WELL DRAWDOWN

OW2

1, 1

-7.72

ET(sec)= 900 WELL DRAWDOWN

OW2

-7.72

ET(sec)= 926 WELL DRAWDOWN

OW2 () -7.79

ET(sec)= 952 WELL DRAWDOWN OW2 -7.79

ET(sec)= 979 WELL DRAWDOWN

0W2

The second of the second of the second of the second of the second of the second of the second of the second of

-7.79

CALIBRATION DATA Well 1 OW3 A=-6.7066E 01 B= 8.2644E-02 D= 1.5000E 01 J0= 272 T0= 71820 ET(sec)= 60 WELL DRAWDOWN e0.8 // / / EWO ET(seo)= 121 WELL DRAWDOWN ET(sec)= 180 WELL DRAWDOWN OW3 7.85 ET(sec)= 241 WELL DRAWDOWN ET(sec)= 301 WELL DRAWDOWN DW3 0,1, 2, 2,60 ET(sec)= 360 WELL DRAWDOWN OW3 7.52 ET(sec)= 421 WELL DRAWDOWN 0ыз 7.43 ET(sec)= 48! WELL DRAWDOWN OW3 7.30 ET(sec)= 541 WELL DRAWDOWN OW3 7.19 ET(sec)= 600 WELL DRAWDOWN OW3 ' 7.10 ET(sec)= 661 WELL DRAWDOWN 7.02 OM3 ET(sec)= 721 WELL DRAWDOWN OW3 ET(sec)= 781 WELL DRAWDOWN OW3 6.27 ET(sec)= 841 WELL DRAWDOWN WELL D.... 6.69 ET(sec)= 900 WELL DRAWDOWN OW3 4, 6.61

ET(sec)= 961 WELL DRAWDOWN

OM3

6.44

```
ET(sec)= 1021
WELL DRAWDOWN
    EW0
                    6.36
    ET(sec)= 1081
WELL DRAWDOWN
           6.28
    CM3
   ET(sec)= 1141
WELL DRAWDOWN
         6.19
   6WO
   ET(sec)= 1200
WELL DRAWDOWN
OW3 6.11
  ET(sec)= 1261
WELL DRAWDOWN
OW3 6.36
  ET(sec)= 1321
WELL DRAWDOWN
  OW3 6.28
  ET(sec)= 1381
WELL DRAWDOWN
  OW3 6.19
  ET(sec)= 1441
WELL DRAWDOWN
  OW3 6.11
  ET(sec)= 1501
WELL DRAWDOWN
  OM3 1,1 1 6.03
 ET(sec)= 1561
WELL DRAWDOWN
OW3 5.95
| 0M3
                   5.95
 ET(sec)= 1621
WELL DRAWDOWN
 6WO
                   5.86
 ET(sec)= 1681
WELL DRAWDOWN
 0W3
                   5.78
 ET(sec)= 1741
WELL DRAWDOWN
OW3 5.61
ET(sec)= 1800
WELL DRAWDOWN
OW3 5.61
ET(sec)= 1861
WELL DRAWDOWN
       5.50
 0M3
ET(sec)= 1921
WELL DRAWDOWN
0W3 5.32
 EW0
                  5.37
ET(sec)= 1981
WELL DRAWDOWN
```

0M3

5.37

El(sec)- 10/1 WELL DRAWDOWN OM3 5.37 ET(sec)= 1981 WELL DRAWDOWN OM3 5.37 ET(sec)= 2041
WELL DRAWDOWN

OW3 5.28

ET(sec)= 2101
WELL DRAWDOWN ON3 . . 5.15 ET(sec)= 2160 WELL DRAWDOWN 5.04 ОИЗ ET(sec)= 2220 WELL DRAWDOWN OW3 4.95 ET(sec)= 2280 WELL DRAWDOWN OW3 4.87 ET(sec)= 2340 WELL DRAWDOWN 0W3 4.79 ET(sec)= 2400 WELL DRAWDOWN OW3 4.71 ET(sec)= 2461 WELL DRAWDOWN 4.62 0M3 ET(sec)= 2521 WELL DRAWDOWN EW0 4.54 ET(seo)= 2581 WELL DRAWDOWN OW3 4.46 ET(sec)= 2641 WELL DRAWDOWN 4.38 0W3 ET(sec)= 2700 WELL DRAWDOWN омз 🤸 . . . 4.29 ET(sec)= 2760 WELL DRAWDOWN DW3 4.21 ET(sec)= 2821 WELL DRAWDOWN 0W3 4.13

And the state of t

ET(sec)= 2881 WELL DRAWDOWN OW3 4.04 ET(sec)= 2941 WELL DRAWDOWN

BARRY CARRON IS

ETCSECT- 27HB WELL DRAWDOWN لالانه омз 🦓 . 4.29 ET(sec)= 2760 WELL DRAWDOWN DW3 4.21 ET(sec)= 2821 WELL DRAWDOWN OW3 4.13 ET(sec)= 2881 WELL DRAWDOWN OW3 4.04 ET(sec)= 2941 WELL DRAWDOWN OW3 3.96 ET(sec)= 3001 WELL DRAWDOWN OM3 . 3.88 ET(sec)= 3061 WELL DRAWDOWN DW3 3.80 ET(sec)= 3121 WELL DRAWDOWN OW3 3.71 ET(sec)= 3181 WELL DRAWDOWN

OW3 3.63

ET(sec)= 3241 WELL DRAWDOWN OW3 3.55

ET(sec)= 3301 WELL DRAWDOWN риз . 3.47

ET(sec)= 3360 WELL DRAWDOWN OW3 3.38

ET(sec)= 3421 WELL DRAWDOWN OW3 3.30

ET(sec)= 3481 WELL DRAWDOWN

OW3 3.22

ET(sec)= 3541 WELL DRAWDDWN DW3 3.14

ET(sec)= 3601 WELL DRAWDOWN

OM3 3.08

ET(sec)= 3660 WELL DRAWDOWN

```
CALIBRATION DATA
Well 1 0W4
A=-6.1285E 01
B= 7.1428E-02
D= 0.0000E 00
J0= 273
T0= 81079
ET(sec)= 60
WELL DRAWDOWN
OW4 71.200
              -14.00
-- 15.56
ET(sec)= 121
WELL DRAWDOWN
               -14.21
 ET(sec)= 180
WELL DRAWDOWN
               -14.35
 0W4
 ET(sec)= 241
WELL DRAWDOWN
                -14.50
 ET(sec)= 300
 WELL DRAWDOWN
               -14.64
 OW4
              361
 ET(sec)= 361
WELL DRAWDOWN
               -14.78
 ET(sec)= 420
 WELL DRAWDOWN
         -14.85
 0W4
 ET(sec)= 481
WELL DRAWDDWN
 OW4 115.00
 ET(sec)≄ 541
WELL DRAWDDWN
              541
                -15.07
 OW4
 ET(sec)= 600
WELL DRAWDOWN
                 -15,14
  0W4
 ET(sec)= 651
WELL DRAWDOWN
  OW4
                 -15.21
  ET(sec)= 720
          DRAWDOWN
  WELL
                -15.28
  OW4
 ET(sec)= 781
WELL DRAWDOWN
                ~15.35
  0W4
  ET(sec)= 841
WELL DRAWDOWN
               841
  0W4
                -15.42
  ET(sec)= 900
WELL DRAWDOWN
```

ET(sec)= 960 WELL DRAWDOWN

**0W4** 

-15.50

```
-15.50
0W4
 ET(sec)= 960
WELL DRAWDOWN
                -15.57
  0₩4
 ET(sec)= 1021
WELL DRAWDOWN
                -15,64
  0W4
  ET(sec)= 1081
WELL DRAWDOWN
                -15.64
  0W4
  ET(sec)= 1141
WELL DRAWDOWN
  WELL
               -15.71
  0W4
  ET(sec)= 1201
WELL DRAWDOWN
  WELL
              -15.78
  0W4
  ET(sec)= 1261
WELL DRAWDOWN
  WELL
  OW4
                -15.85
  ET(sec)= 1321
WELL DRAWDOWN
                -15.85
  OW4
  ET(sec)= 1380
          DRAWDOWN
  WELL
  0W4
               --15.92
  FT(sec)= 1440 . 24 m
         DRAWDOWN
  WELL
  OW4
                -16.00
  ET(sec)= 1501
WELL DRAWDOWN
  WELL
  OW4
                -16.07
  ET(sec)= 1561
WELL DRAWDOWN
  0W4
                -16.07
  ET(sec)= 1621
  WELL DRAWDOWN
  0W4
                -16.14
  ET(sec)= 1680
WELL DRAWDOWN
0W4
            -16.21
 ET(sec)= 1740
WELL DRAWDOWN
  0W4
                -16.21
 ET(sec)= 1801
WELL DRAWDOWN
  0W4
                -16.28
 ET(sec)= 1861
WELL DRAWDOWN
  OW4
                -16.35
 ET(sec)= 1920
WELL DRAWDOWN
```

**0W4** 

1

-16.42

FT(sec)= 1801 WELL DRAWDOWN

0W4

-16.28

ET(sec)= 1861 WELL DRAWDOWN

CW4

-16.35

ET(sec)= 1920 WELL DRAWDOWN

**0**W4

-16.42

ET(sec)= 1980 WELL DRAWDOWN

**0**W4

-16.50

ET(sec)= 2040 WELL DRAWDOWN

0W4

-16.50

ET(sec)= 2100 WELL DRAWDOWN

OW4

-16.57

ET(sec)= 2161 WELL DRAWDOWN

0W4

-16.57

ET(sec)= 2221 WELL DRAWDOWN

OW4.

-1.49

ET(sec)= 2280 WELL DRAWDOWN

OW4

-1.35

ET(sec)= 2341 WELL DRAWDOWN

-1.21

ET(sec)= 2481
MELL DRAWDOWN

OW4 -0.99

ET(sec)= 2461
WELL DRAWDOWN

**'**44

-0.92

RECOVERY TEST 7/11/84

WATER LEVEL

15 WATER

ABOVE YOURE

TRANSTOUR AT

DIPP! OF 30'

CM-5 TIME WATER LEVEL 17.0556 16.7000 17.0611 16.7000 17.0625 16.7000

SHOOK

17.0933 15.7967
17.0933 16.7645
17.0933 15.2161
17.0933 15.4096
17.0933 15.5387
17.0933 15.6032
17.0933 15.8612
1 15.5387
17.0933 15.6677
17.0933 15.2806
17.0933 14.9580

17.1122 15.3451 17.1122 15.4741 17.1122 15.6032 17.1122 15.7322 17.1122 15.7367 17.1122 15.9258 17.1247 16.3129 17.1318 16.5709

117.1512 15.6032 117.1542 16.1838-117.1613 16.5064 117.1642 16.6354 117.1642 16.7645 117.1743 16.7645 117.1812 16.7645 117.1812 16.8290 17.1913 16.8290 17.2012 16.8290 17.2013 16.8290 17.2013 16.8290 17.2014 16.8290

About is 143' below top of carry 5.4. 1.3' Yould at 35!0 Down

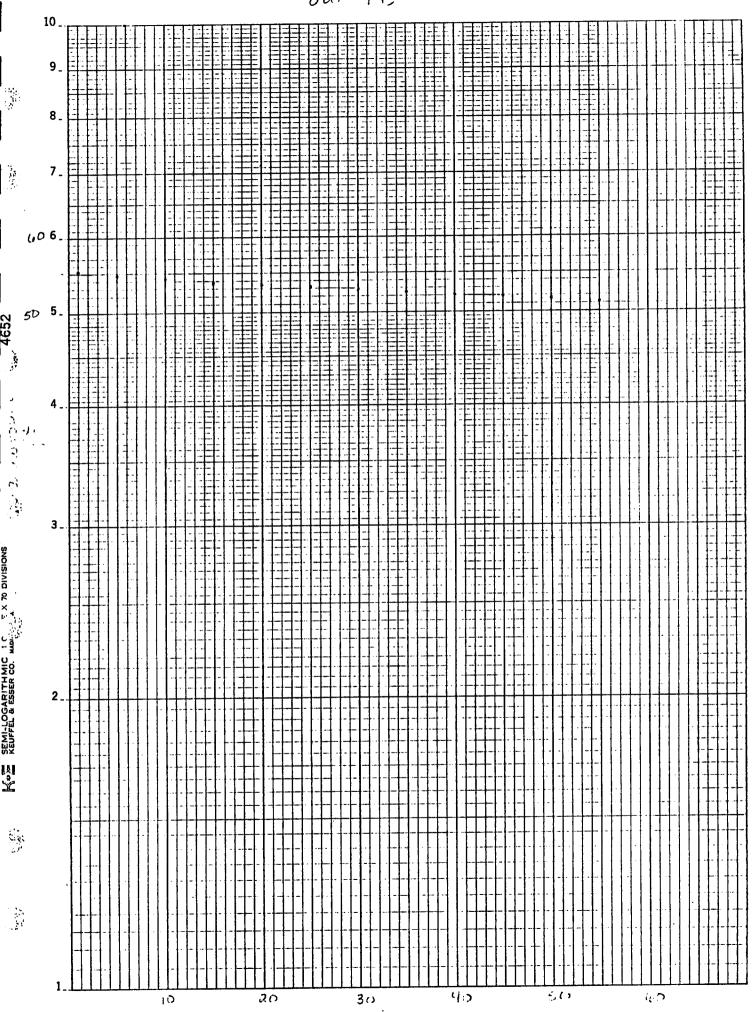
OW-6 TIME WATER LEVEL \$7.4344 17.7653 17.4354 17.7653 17.4404 17.7653

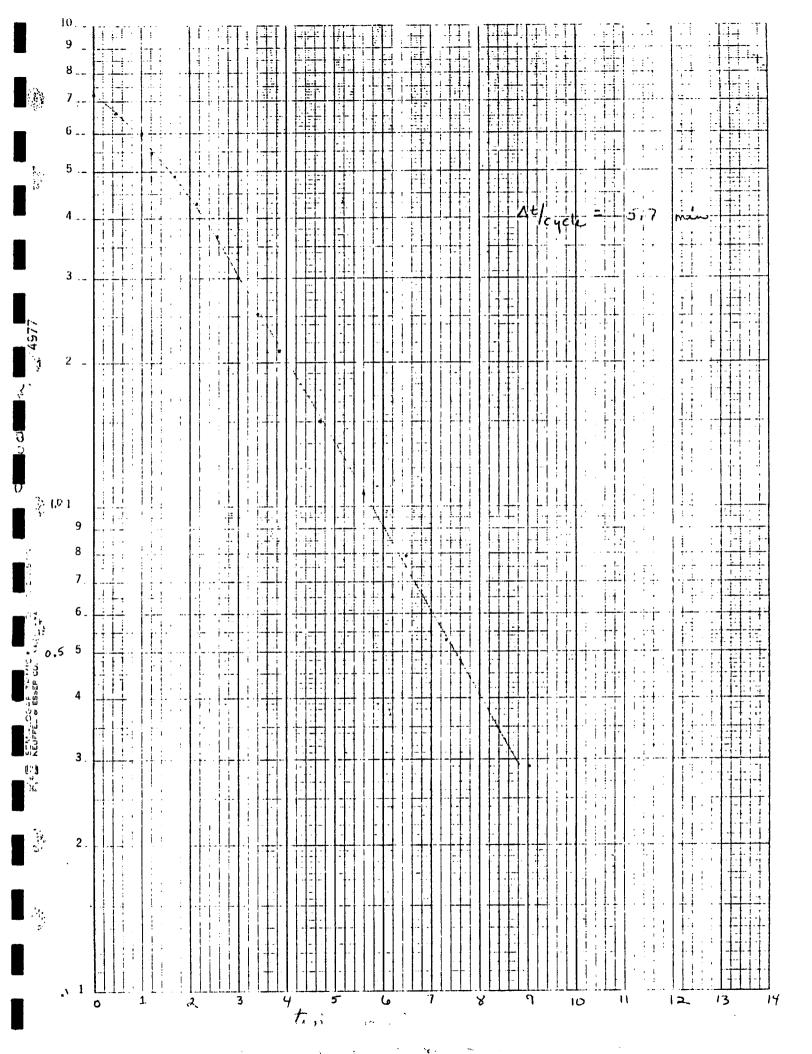
17.4923 15.0202 17.4933 15.8045 17.4944 16.0006

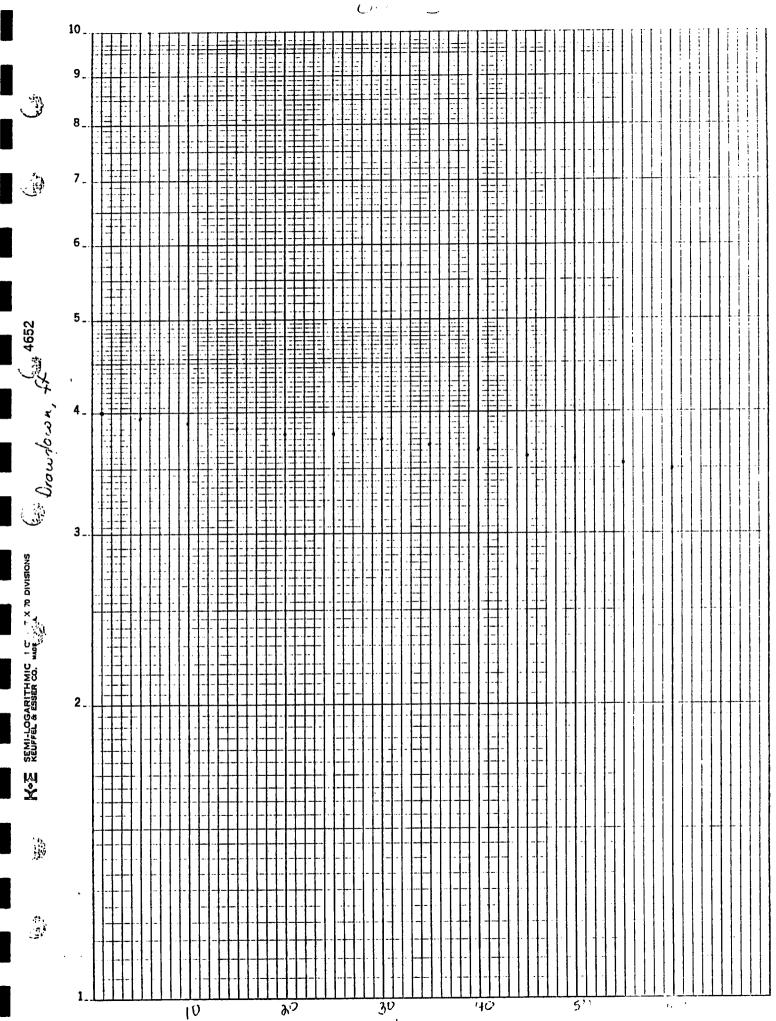
117.5021 15.8045 117.5036 16.0006 17.5051 16.2620 12.5106 16.4581 <17.5121 16.5888 17.5136 16.7196 717.5205 17.5432 \* \* SUSPECT DATA

Aluke 2 17.35 344 49.

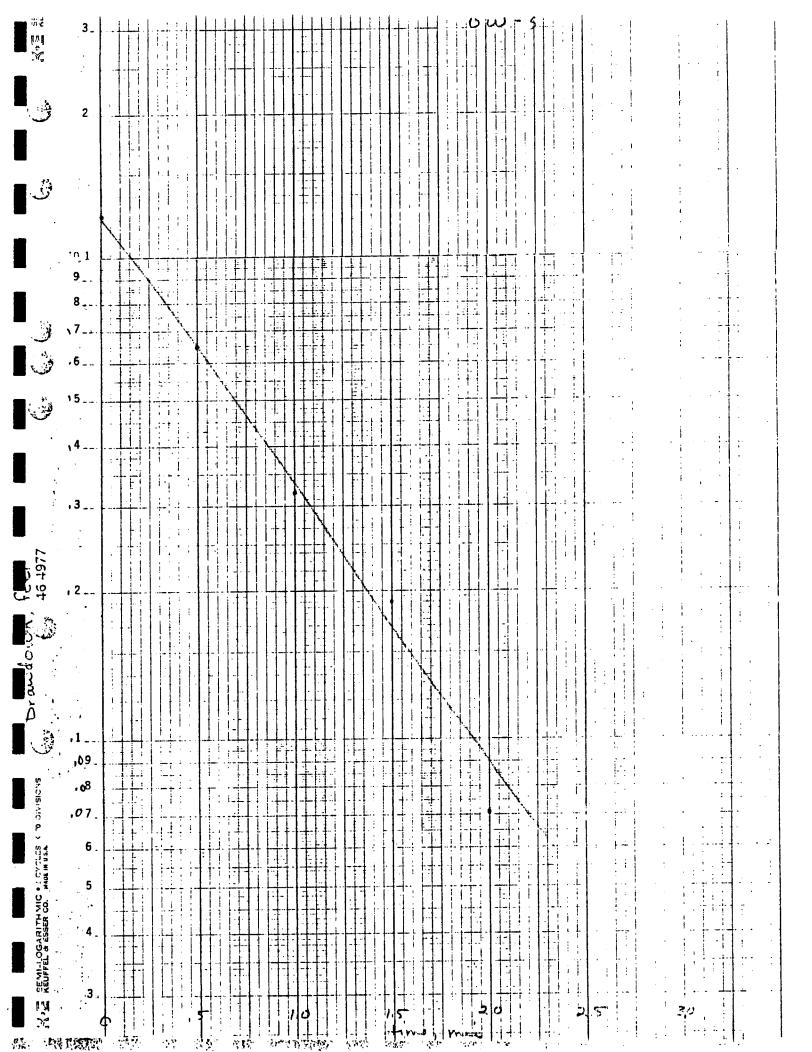
time nim

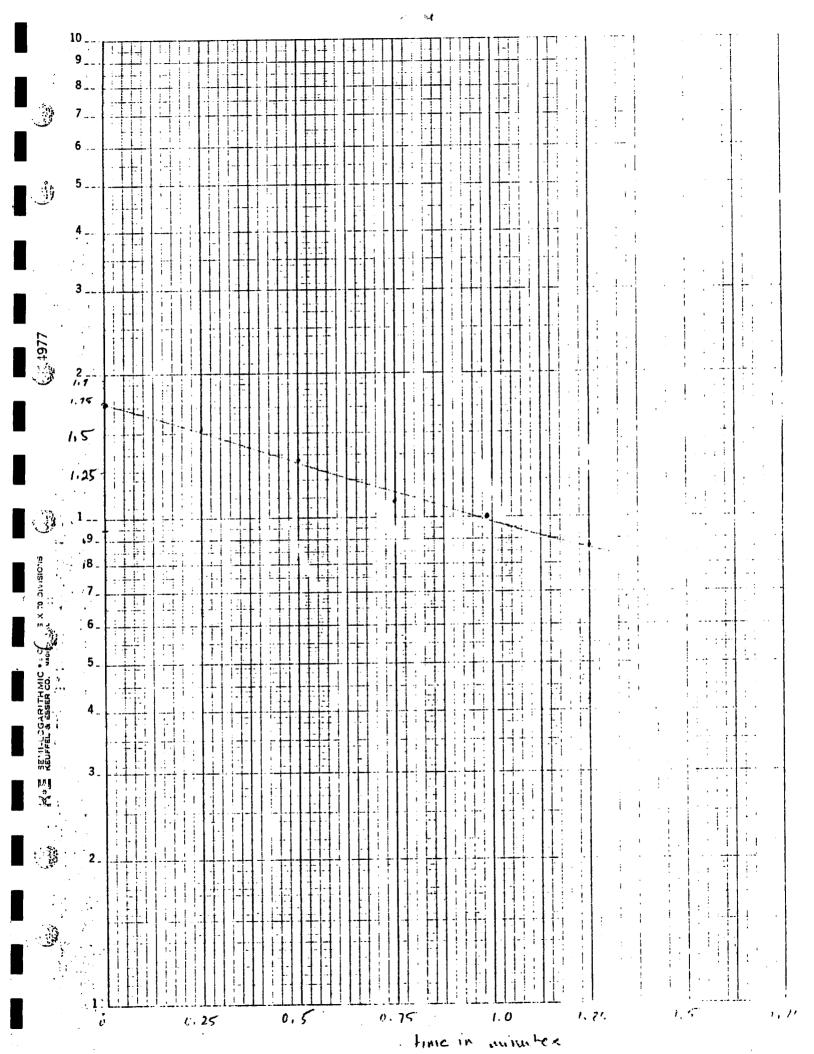






minules





have F · 0ω-1 from Atragrit line m = 1 H, = 2.63 pt = 80,2 cm L= 6 ft = 183cm 6, = 60 sec D= 17 cm 4= 0.34 ft = 10.4 em d= 5 cm t= 360 sec 3 ( 182,9) >4  $\frac{2mL}{D} = \frac{2mL}{D}$  $h = \frac{d^2 \ln\left(\frac{4m4}{p}\right)}{8 + (t_2 - b_1)} \ln \frac{H_1}{H_2}$  $\frac{5^{2} \ln \left(\frac{4(1)(183)}{17}\right) \ln \left(\frac{80.2}{10.4}\right)}{8(183)(300)}$ h = ...  $\frac{25(3.763)}{(2.04)}$ 4.37 × 10 4 cm/sec

assume m = 1  $H_1 = 55.3 \text{ ft} = 1685.5 \text{ cm}$  L = 14 ft = 426.7 cm  $t_1 = 60 \text{ sec}$  0 = 17 cm  $H_2 = 51. \text{ ft} = 1554.5 \text{ cm}$ d = 5 cm  $t_2 = 3300 \text{ sec}$ 

 $h = \frac{d^2 \ln \left(\frac{4mL}{b}\right)}{8 L \left(\frac{4-L}{b}\right)} \ln \frac{H}{H_a}$ 

 $h = \frac{(5^2) \ln \left(\frac{4(.)(426.7)}{17}\right)}{8(426.7)(3300-60)} \ln \left(\frac{1686}{1535}\right)$ 

 $hh = \frac{25 (4.609)}{11060064}$  for 0.08088

hh= 8,43 ×10-7 cm/sec

Assume m=1 L=9ft=2.74.3 cm  $t_1 = 4.4' = 670.6 \text{ cm}$  L=9ft=2.74.3 cm  $t_2 = 0.42' = 12.8 \text{ cm}$  d=5 cm  $t_3 = 480 \text{ sec}$ 

 $\frac{h}{2} = \frac{d^2 \ln \left(\frac{4mL}{0}\right)}{8L\left(\frac{4}{2}-t_1\right)} \ln \frac{H}{H_2}$ 

 $8h = \frac{5^2 \ln \left(\frac{4(1)(274.3)}{5}\right)}{8(274.3)(480-120)} \ln \left(\frac{670.6}{12.8}\right)$ 

(25) 5.3911 789984 3,9587

kh = 6.75 × 10 4 cm/sec

Case F

assume m=1 L=12 ft = 366 cm D=17 cm d=5 cm d=5 cm d=3600 pcc

kh= d2 ln (4 m L) ln H,
8 L-(k2-t,) ln H2

 $h_{k} = \frac{(5^{2}) \ln \left(\frac{4(1)(366)}{17}\right)}{3(366)(3600-60)} \ln \left(\frac{121.9}{106.7}\right)$ 

 $h_{h}$  =  $\frac{35(4.4557)}{10365120}$  (0.1332)

hh= 1.43×10 cm/sec

L= 13 ft = 39le cm R: D= 6.75 in= pt2 H = 5.8 /6 = 17/1 d = 2 in = 5 cm. # = W.Dec 169, # = 5.54/E= ##S  $k_{h} = \frac{d^2 \ln \left(\frac{4mL}{D}\right)}{8 L \left(\frac{4s-L}{D}\right)} \ln \frac{H}{H_2}$ Ez = 2160, Rec 25 (4.53) (.04625) 6652800. Inh= 3685 (2000) Standard on 7.88 × 10-7 cm/sec

Case F

000-5

assume m= 1

L = 14 ft = 3 426.7 cm

D=117.00

d = 5 cm

kn=

 $\frac{d^{2} \ln \left(\frac{4mL}{D}\right)}{8L\left(\frac{t_{2}-t_{1}}{T}\right)} \ln \left(\frac{H_{1}}{H_{2}}\right)$ 

H, = 0.65 = 19.8

t, = 0.5 min = 30

H, = 00009 = 2.

ty = 2 min = 120;

4.6

= 115.2(5) ln (19.8) ln (19.8)ln (2.7)

8 (427) (120-30)

307440

(1.99

7.5 × 10 4

t and the second 
. . . . . . .

Case 1

0W-Le

 $H_{1} - 1.5 = 45.7$  L = 12.1' = 3368.7 cm  $H_{2} - .87 = 24.5$  L = 17 cm L = 5 cm

 $k = (25) \ln \left( 4.368.8 \right)$  8 (360.8) (30) 26.5

(111,5),(.54)

121

6,8 × 10 -4

11) BACKGROUND INFORMATION

ACTION	INFO	
To:		File: 13305-00
		X-Ref:
		37161
		Date: 5/2/8-3
	// >	11 Date: 15/22/8.3
From: Teleen Du	Mepan	Reply Required By:
Subject: Concersale	on with Neapa	Reply Required By: La Co DOH - Muke Hopk
<b></b> ( )		
mid with	Mike Hoskins	of Niapara Co DOH
Mer rouse	7 14	Mianara Co
6 discuss Ph	are I sures	in Niapara Co.
11 51	/	
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Ne ix	unaware of 4	ng
1 11 de	as camper.	although
shallow or a		und for
holienes it	could be the	1.
1 1 - 0	MILLIOSEL W 5	o desilla.
Cadwillas /	could be us surposes, if 5	
		<u> </u>

Ellen

ROUTING

ACTION	INFO	
To:		File: 13305-00/
		X-Ref:
		A-neti
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Nate: 5/a/83
From: Ellen J.	lligan	Reply Required By:
From: Ellen Ja Subject: Endangered	L Species / Cret	real Habitat
<b>5</b> / / /.		
Day 5/2/8	3 d met wit	a bordon
		). A KIVE DEC
Bout deller of	1 Fish + Wuldl	fe NISDE
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Replon 7 Chang	Hand &	critical habita
make outline	ing weren.	
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for the sec		He myratory
The	area, is	
Al	Saleons 410	glee, but there
parning of		1 -1 Hade
are not cri	tical habite	Car you
burde with	in mute	•
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(22 K

Peter Buechi, Senior Sanitary Engineer, Region 9 Hartin S. Ferguson, Environmental Chemist, Hazardous Site Control Sample Testing from the Nash Road Site

August 29, 1983

Enclosed is a Laboratory Test Report for the sampling of ponded water taken July 11, 1983 at the Mash Road Site. Diethyl phthalate, Terbutol and Toluene were identified in the extracted sample. The former and latter are hazardous wastes (priority pollutants).

MSF:cl Anclesure

cc: J. Rankin 'C. Goddard

## NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division	of Solid Wa	<u>ste</u>	Mobile Laboratory		ory		
Facility: Nash RQ.		Sample Type: Pardel 16.					
	oled: 7/11/						•
Sampling Site  Lab. Number		Porder 14,0.					
		83-191-01					
Parameter	Units						
pll	su .			·	·		
ductivity	oluns						
Cd	mg/1				•		4" +1
<u> </u>	mg/1	,	•				
Zn	mg/1						
Cr	mg/1_	i					5.1.
Pb	mg/1	,					
N1.	mg/1						1.1
Cu	mg/1			•		·	1 ,
GCINS	indent	Terbuto)					
	ident	diethyl phthaby		:			. ;: .
							1 3
TOLUENC	ug/l.	42.7					
·							4
							10 j
		,	*			;	1416
	1						10 Miles
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### NIAGARA COUNTY HEALTH DEPARTMENT

### MEMORANDUM

DATE: January 27, 1984

TO:

Peter Buechi

FROM:

Michael Hopkins 11 46 ph

SUBJECT:

INFORMATION REGARDING NIAGARA SANITATION

NASH ROAD LANDFILL (REQUESTED IN DECEMBER 1983

TELEPHONE CONVERSATION)

Attached are copies of various documents from our files regarding the Niagara Sanitation - Nash Road Site. These documents are provided for your information and may be provided to your consultants for Phase II State Superfund investigation provided this department is properly credited for any information used in the Phase II report or subsequent reports.

This department has various other information regarding this site which is not attached but is available for inspection if desired. This information includes drawings of the Hooker "Brine Line", City of North Tonawanda Sewer maps for nearby areas, original drawings by Krehbiel Engineers showing the proposed location and dimensions of the disposal trench for Love Canal wastes, original letters between DOT and NCHD (1968) and original boring logs and locator drawings for test borings made on site in 1968 prior to digging the disposal trench.

The investigation conducted by this department in June, July and August of 1983 came to the following conclusions:

- 1. There is reasonable evidence in the form of plans, correspondence, etc., which indicates that wastes from the Love Canal were disposed of at this site. It is suspected that disposal occurred in a trench dug specifically for this purpose.
- 2. This department was unable to locate any person who claims to have been present when Love Canal wastes were disposed of or who could provide first-hand information on such disposal.
- 3. Various area residents, former residents, City of North Tonawanda officials and a former equipment operator have reported that industrial wastes were observed in areas of landfill used for municipal disposal. Those wastes are said to include caustics in drums, battery cases, graphite, pallets and laminating compounds, but not the wastes from Love Canal.

Peter Buechi Page 2 January 27, 1984

- 4. It is believed that much of the municipal waste and the industrial wastes listed above were buried in former ponds and borrow pits. Most of the disposal area was always wet and swampy prior to disposal activity. At least one large trench was dug specifically for municipal waste disposal.
- 5. There is no specific evidence indicating that off site migration of contaminants has occurred or that a direct contact hazard is present; however, the available data is not conclusive in this respect.

This department considers follow-up investigation at this site to be necessary. Additional sampling and analysis of soil and groundwater are considered necessary to confirm whether or not residential areas adjacent to the site have been impacted by contaminants from the site. This department is also concerned that adequate data is not available to assess the potential of exposure to persons who may be on site, regardless of whether such persons are on site legally or illegally.

This department requests that we be kept informed of any activities of DEC with respect to this site and that we be kept informed of any additional information your department may have or obtain in the future.

Please feel free to contact me with any questions.

MEH:cs Attachments

cc: M. N. Vaughan

August 9, 1978.

Disposal of Chemical Waste
Contract FAC 67-15; PALSE 67-1
LaSalle Arterial, Eingara Falls, Niagara County ORIGINAL SIGNED BY
D. H. KETCHUM

D. H. Ketchum, Regional Director - Region 5

stockpile.

W. C. Hennessy, Commissioner of Transportation, Bldg. 5, Foom 507

co profeser M.J. Copy

During the course of construction of the LaSalle Arterial in the City of Niagara Falls, buried chemical waste was encountered during excavation for a storm sewer line along Frontier Avenue between 97th and 99th Streets. Further exploration revealed that the chemical waste material extended under the proposed location of relocated Frontier Avenue north of the existing street. The total quantity of chemicals in the proposed roadway was estimated to be 1100 CY. No chemicals were found under, or south of, existing Frontier Avenue.

When the sewer line excavation first began, the chemicals were piled to one side along with the other excavated material. This prompted several complaints from adjacent property owners about the offensive odor of the unterial.

After consulting with Hooker Chemical and the Miagara County .
Health Department, some of the chemicals were trucked to an existing dump owned by Hooker off Hydo Park Blvd. near the north city
line of Miagara Falls. After approximately 200 CY were disposed
of at this location, the contractor was advised by Hooker officials that no more would be accepted at their dump.

After negotiation with the Town of Wheatfield, and with the approval of the Wiagara County Health Department, the remainder of the chemical waste was trucked to a Town dump area off Nash Road in the Town of Wheatfield.

The following is a chronological summary of events from Narch 15, 1968, when the chemicals were first encountered to July 15, 1968, when the disposal of the chemicals was completed.

Date	<u>Event</u>	20/11/03
3-15-68	First encountered chemical waste material between 97th and 99th Sts. in relocated Frontier Ave. area.	Engineer's Dirry
3-15-68	Contacted Hooker Chem. Co. requesting information on material makeup.	Joe Cains Diary
3-19-68	Mr. Capong, property owner, complained of stench coming off chemical waste	Ingineer's disry Joe Chin's disry

CAUSEA

	•	•
, ē	Event .	Source
<b>)-68</b>	Messrs. Popovici, Maida, Miagara County Health Dept. investigating	Joe Cain's diary
3-22-68	Ken Reitmeier, Supervising Soils and Naterials Engr., investigated and wrote memo this date recommending removal of chemical waste.	Memo dated 3-22-68
3-25-68	Mr. Popovici telephoned ordering chemical waste excavated to date, removed from project site and disposted of at a dump operated by Hooker Chemical Co. located off Hyde Park Blvd. near north city line	
3-27-68	Letter confirming the telephone conversation 3-25-68 from Ernest R. Gedeon, Niagara County Health Dept.	Letter dated 3-27-68
4-1-68	Letter from J.P. Cain, ordering con- tractor to remove chemical waste to the Hooker Dump on Hyde Park Dlyd.	Letter dated 4-1-68
4-1-68	Stimm sent letter disputing work to removed chemical waste material.	Letter dated 4-1-68
4-3-68	Removal of chemical waste to Hooker's dump site off Hyde Park Blvd. began.	Joe Cain's diary
4-8-68	Hooker officials (Fred T. Olotka) ordered a halt to further dumping of chemical waste at their Hyde Park Blvd. dump. Niagara County Health Dept. informed.	Joe Cain's diary.
4-15-68	Letter to Robert W. Sweet, Chief Engineer from A. J. Kopczynski necommending extra payment for work to remove approx. 1,000 CY of chemical waste.	Letter dated 4-15-69
4-23-68	Letter to J. P. Cain from Stimm request- ing permission to use Town of Wheat- field dump site.	Letter dated 4-23-68
4-25-68	Maps and borings received from Krehbiel, Quay, Rugg & Hall, Engr Bel Air Subdivision.	Package dated 4-25-68
5-1-68	Letter to Ernest R. Gedeon, Chief Air Pollution Control, Niagara County Health Dept. from J.P. Cain outlining proposed method of disposing of chemical waste.	Letter dated 5-1-68

Date	Event	Source
5-3-68	Wm. Friedman, Jr., Asst. Comm. of Env. Health, telephoned listing informa- tion he will require before approval of Wheatfield site is given.	Memo to Files dated 5-3-6B
5-6-68	Letter from Friedman confirming the above telephone conversation (5-3-68) to Brzeninski (Stimm) requesting permission to use Cheatfield dump.	Letter dated 5-6-68
5-9-68	Letter from Hooker (Fred Olotka), listing makeup of chemical waste from ground samples taken.	Letter dated 5-9-68
5-16-68	Boring taken on Frontier Ave. between 97th and 99th Sts. to determine the limits of chemical waste.	Memo dated 5-15-68, P. Howadl to J.P.Cain
5-16-68	Borings of proposed Whoatfield dump site sent to Friedman, Niagara County Health.	Letter dated 5-16-58, P. Nowadly to Friedman
5-21-63	Verbal permission received from Friedman granting permission to use Wheatfield site. Lotter ordering Stimm to excavate and remove chemical waste to Wheatfield.	Letter dated 5-21-8 Cain to Stimm.
5-27-68	Began excavating Wheatfield dumpsite.	MURK II dated
5-6-68	Began hauling chemical waste to dump.	MURK II 6-6-68
7-15-68	Complete all work including regrading dump site.	MURK II 7-15-68

The disposal area off Nash Road was visited on August 8, 1978 by J. Powers, Jr., and P. Goodman of my staff. Although they were unable to pin point the exact location of the buried chemicals, the approximate area was examined and no sign of the chemicals was found. The area in which the chemicals were buried was an excavation approximately 100 ft. by 30 ft. by 27 ft. deep. The area is located in a Town of Wheatfield dump just north of the North Tonawanda City Line, approximately 1/2 mile east of Nash Road and 1/2 mile south of Niagara Falls Blvd. There has been no development in the area and no apparent hazard exists at this time.

Our records indicate that the chemicals were placed in the 100' x 30' area to a depth of approximately 15 ft. and covered with at least 12 ft. of the excavated material. A review of Inspectors' reports indicates that the estimate of 1100 CY of chemicals was exceeded by about 50 percent for a total of 1600 CY + placed in this excavation.

Disposal of the chemicals in the Nash Road area was done with the full knowledge and consent of the Town of Wheatfield and the Niagara County Health Dept. Soil exploration was conducted by our soils Engineer prior to disposal of the chemicals and the area was found to be acceptable for disposal purposes.

Attached are copies of all pertinent correspondence, drawings and boring logs.

DHK: JEP: mh

Attachments

## I Tecker Industrial chemicals bivision

NIAGARA FALLS, NEW YORK 14302, PHONE (716) 285-6555

May 9, 1968

Mr J P Caine
Resident Engineer NYS Dept of Transportation
355 - 77th Street
Niagara Falls, New York

Subject: LaSalle Expressway - Ground Samples

Dear Mr Caine:

inis letter is written in reply to your phone conversation with us on May 3rd.

Samples of liquors taken from the 97 - 99th Streets excavation on March 15, 1968 analyzed as follows:

Specific gravity @ 25°C = 1.198
pH = 3.0
Loss on ignition = 86.4%
Flash pt °F 130 (Cleveland open cup)

Chlorate, Phosphorous and Fluoride = None

We were able to detect small amounts of chlorotoluenes, trace benzoyl chloride and approximately 5% benzoic acid in this material.

T sample taken represented the worst portion of the excavation. It was obtained from organic puddles in the vicinity of the dirt pile.

Very truly yours

Fred T Olotka

Technical Supervisor

s j

cc W M Friedman - Niagara County Health Department

E R Gedeon - Niagara County Health Department

E Padlo

J N Brogard

# NEW YORK STATE GEOLOGICAL ASSOCIATION 54th ANNUAL MEETING October 8-10, 1982 Amherst, New York

GUIDEBOOK FOR FIELD TRIPS IN WESTERN NEW YORK, NORTHERN PENNSYLVANIA AND ADJACENT, SOUTHERN ONTARIO

Edward J. Buehler and Parker E. Calkin Editors

Department of Geological Sciences State University of New York at Buffalo Held in Conjunction with 11th Annual Meeting Eastern Section American Association of Petroleum Geologists

Published by the New York State Geological Association. Guidebook available from the executive secretary: M.P. Wolf, Geology Department, Gittleson Hall, Hofstra University, Hempstead, New York 11550.

## NEW YORK STATE GEOLOGICAL ASSOCIATION 38<sup>th</sup> Annual Meeting April 29 - May 1, 1966

## **GUIDEBOOK**

Geology of Western New York Edward J. Buehler, Editor

Department of Geological Sciences State University of New York at Buffalo

Additional copies are available from the permanent secretary of the New York State Geological Association: Dr. Kurt E. Lowe, Department of Geology, City College of the City University of New York, 139th St. at Convent Ave., New York, N. Y.

# Soil Mechanics

T. William Lambe • Robert V. Whitman

Massachusetts Institute of Technology

1969

John Wiley & Sons, Inc.

New York

London

Sydney

**Toronto** 

in which

k =the Darcy coefficient of permeability

 $D_{\star}$  = some effective particle diameter

 $\gamma$  = unit weight of permeant

 $\mu = viscosity of permeant$ 

e = void ratio

C =shape factor

The following is an expression for the permeability of porous media, known as the *Kozeny-Carman equation* since it was proposed by Kozeny and improved by Carman:

$$k = \frac{1}{k_0 S^2} \frac{\gamma}{\mu} \frac{e^3}{(1+e)}$$
 (19.5)

in which

k<sub>0</sub> = factor depending on pore shape and ratio of length of actual flow path to soil bed thickness
 c = crecific surface area

S = specific surface area

Since  $D_s$  is defined as the diameter of particle having a specific surface of S, Eq. 19.4 can be considered a simplification of the Kozeny-Carman equation.

Table 19.1 Coefficient of Permeability of Common Natural Soil Formations

Formation	Value of k (cm/sec)
River deposits	•
Rhone at Genissiat	Up to 0.40
Small streams, eastern Alps	0.02-0.16
Missouri	0.02-0.20
Mississippi	0.02-0.12
Glacial deposits	
Outwash plains	0.05-2.00
Esker, Westfield, Mass.	0.01-0.13
Delta, Chicopee, Mass.	0.0001-0.015
Till	Less than 0.0001
Wind deposits	
Dune sand	0.1-0.3
Loess	0.001 ±
Loess loam	0.0001 土
Lacustrine and marine offshore	
deposits	
Very fine uniform sand,	
$U^a = 5-2$	0.0001-0.0064
Bull's liver, Sixth Ave., N.Y.,	
U=5-2	0.0001-0.0050
Bull's liver, Brooklyn, $U = 5$	0.00001-0.0001
Clay	Less than 0.000000

U = uniformity coefficient.
 From Terzaghi and Peck, 1967.

Table 19.2 Classification of Soils According to Their Coefficients of Permeability

Degree of Permeability	Value of k (cm/sec)
High	Over 10 <sup>-1</sup>
Medium	10-1-10-3
Low	$10^{-3} - 10^{-5}$
Very low	10-5-10-7
Practically impermeable	· Less than 10-7

From Terzaghi and Peck, 1967.

Equation 19.4 or 19.5 aids considerably in the following examination of the variables affecting permeability. In this examination those characteristics related to the permeant are considered first and then those related to the soil composition are treated.

### Permeant

Equations 19.4 and 19.5 show that both the viscosity and the unit weight of the permeant influence the value of permeability. These two permeant characteristics can be eliminated as variables by defining another permeability, the specific or absolute permeability, as:

$$K = \frac{k\mu}{\gamma} \tag{19.6}$$

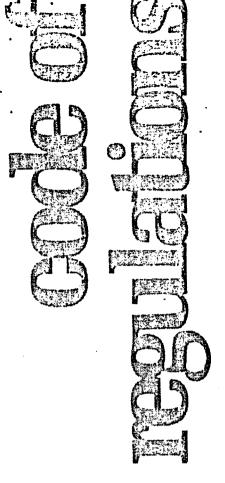
Since k is in units of velocity, K is in units of length<sup>2</sup>; e.g., if k is in cm/sec, the corresponding unit for K is cm<sup>2</sup>. K is also expressed in terms of darcys; 1 darcy = 0.987  $\times$  10<sup>-8</sup> cm<sup>2</sup>. For water at 20°C, the following two equations permit one to convert k in cm/sec to K in cm<sup>2</sup> or in darcys:

$$K \text{ in cm}^2 = k \text{ in cm/sec} \times 1.02 \times 10^{-5}$$
 (19.7)

K in darcys = 
$$k$$
 in cm/sec  $\times 1.035 \times 10^3$  (19.8)

Figure 19.6 is a chart for the conversion of permeability values from one set of units to another. (Conversion factors are given in the appendix.)

While viscosity and unit weight are the only variables of the permeant that influence the permeability of pervious soils, other permeant characteristics can have a major influence on the permeability of relatively impervious soils. The magnitude of influence for characteristics other than viscosity and unit weight are illustrated in Fig. 19.7. In this figure values of permeability of saturated kaolinite are plotted for various permeants. The permeability is expressed in terms of the absolute permeability, thus the influences of viscosity and unit weight have been eliminated. The data in Fig. 19.7 show that the nature of the permeant can be very important, with variations of many hundred percent in absolute permeability depending on the actual permeant. The



# Protection of Environment

## 40

PARTS 190 to 399
Revised as of July 1, 1983

CONTAINING
A CODIFICATION OF DOCUMENTS
OF GENERAL APPLICABILITY
AND FUTURE EFFECT

AS OF JULY 1, 1983

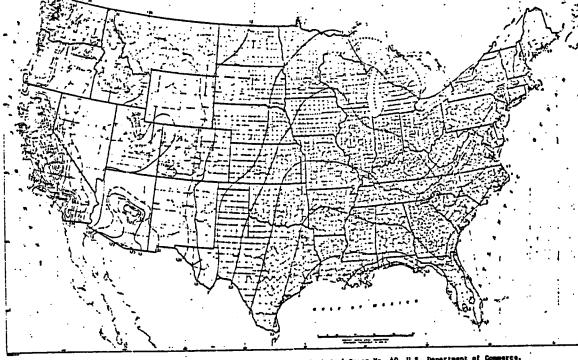
With Ancillaries

Published by the Office of the Federal Register National Archives and Records Service General Services Administration

as a Special Edition of the Federal Register







Source: Rainfall Prequency Atlas of the United States, Technical Paper No. 40, U.S. Department of Commerce U.S. Government Printing Office, Machington, B.C., 1963.

Figure 8
1-Year 24-Hour Rainfall (Inches)

686

Center, Ashville, N.C., 1979.

Figure 4 Mean Annual Lake Evaporation (In Inches)



Normal Annual Total Precipitation (inches)

## NAME OF LANDFILL

NIAGARA SANITATION COMPANY (DEC #932054)

## LOCATION .

Nash Road, Town of Wheatfield

The site is estimated to be about seven acres in size and located north of the Niagara Hohawk easement which straddles the North Tonawanda - Wheatfield town line. The site extends from the eastern end of the access road running from Nash Road approximately 350 yards east to the fork in the power easement (Tower #365). The site is estimated to be 120 yards wide at the western end tapering to about 70 yards wide at the eastern end.

The landfill location and extent are shown on the attached

drawing.

OWNERSHIP

The property is owned by the Town of Wheatfield.

## HISTORY

This landfill was used by the Niagara Sanitation Company for waste disposal from 1964 to 1968. The refuse site was used for both industrial and municipal refuse. The site received refuse from Niagara Falls Air Force Base, Bell Aerospace, Carborundum, Frontier Chemical, Graphite Specialties, Continental Can and Grief Bros. Wastes disposed of may include caustics, plating tank sludge and municipal wastes.

Historical information was obtained from <u>Hazardous Waste</u> Disposal Sites in New York State, Volume 3, NYS DEC.

## INVESTIGATION

A site visit was made by Mr. M.E. Hopkins of the Niagara County Health Department on June 11, 1981. The site was found to be poorly covered with protruding refuse. Visible items included rubber blocks, tubes and hoses, tires, concrete fragments and other demolition debris, broken glass, ash, wood, rusted cans and pieces of graphite rods. Also found were what appeared to be remnants of steel drums. There was evidence of some unauthorized dumping after the site was closed. Access to the site was not restricted.

Red-brown (rust-colored) stains were found on vegetation and soil in numerous locations around the perimeter of the site, particularly along the northern and western edges. Additional stained areas were found throughout the marshes and other low points within the site. Although most of these stained areas were dry, two areas were found beneath standing water. It was noted that although the ground was stained beneath the water, the water was not discolored. No flowing leachate streams were found. The sampling well was not found on the June 11th visit. A well was found on June19th on a subsequent visit. The well was located 20 feet east of Niagara Mohawk Tower #363. The location is shown on the attached drawing. The well had apparently been

## INVESTIGATION (continued)

vandalized. The upper standpipe had been broken off at ground level and the well had, therefore, been left uncovered. The well may still be useable for sampling.

No evidence of landfill activity was noted east of Niagara Mohawk Tower #365. However, USDA aerial photographs (ARE 3V-75;1966) indicate that the landfilled area may extend 300 to 400 ft. east of Tower #365.

## SOILS

The soils surrounding the site are Raynham and Canandaigua series soils. The composition of the soil contained with the site itself is not known, although it is expected to be largely composed of refuse. The surface is generally a silty clay material with some sand in spots. Portions of the site are marshy while others appear well drained, indicating that the soil may not be uniform throughout the site. Boring records of the sampling well immediately south of the site, indicate a profile of silty sand and sandy will immediately south of the site, indicate a profile of silty sand and sandy silt to a depth of about 9 feet over clay to an unknown depth. The records also show the water table at 4 feet. This suggests that the water table may be perched. Fluctuations of the water table are not known.

## **CONCLUSIONS**

The potential for the migration of contaminants off-site is present. Visible leachate stains and the odor in the well south of the landfill indicate that material may be leaching in perched groundwater. Permeable soils in some areas could allow lateral migration. The site requires proper closing. The proximity of houses along Forbes Road and potential for migration justify sampling at this site.

## SAMPLING

well and soil samples were taken for THO, heavy metals and phenol analysis. It was noted at the time of sampling, that the water drawn from the well was discolored gray and strongly odorous with an organic odor. A slight oily sheen was present on the surface of the sample. Two soil samples were taken near Towers #364 and #365. These samples were taken from the bottoms of hand augered holes roughly 4 feet deep. The boring near pole #364 indicated a gray silt over a darker gray silty clay layer at the point of sampling. The second boring showed a tan silty clay over clay at about 4 feet. The sample was taken from this interface. Groundwater was encountered slightly below the 4 foot level in both holes.

## RECOMMENDATIONS

This site must be properly closed. Additional sampling wells along the Niagara Mohawk easement would be desireable to facilitate future sampling. The existing well should be maintained. Annual inspection and periodic monitoring is recommended. The Town of Wheatfield was notified to submit an abatement plan for the site.

## SUMMARY OF SAMPLES TAKEN

•	SUMMAR	CY OF SAMPLES	IAKLN		<b>NEAREST</b>
SAMPLE #	LOCATION	TYPE	PARAMETER	DATE	HOUR
, ,	Grativick # 13	well	Netals	7/16/81	11:00
. 2	Grativick # 10	well	Metals	7/16/81	11:00
3	Gratwick # 11	well	Metals	7/16/81	11:00
4	Gratwick # 12	well	Hetals	7/16/81	11:00
5	Gratwick # 13	well	THO	7/16/81	11:00
	Gratwick # 10	well	TH0	7/16/81	11:00
6 7	Grativick # 11	well	THO	7/16/81	11:00 ·
8	Gratwick # 12	well	THO	7/16/81	11:00
9 .	Nia: Sanitation	well	Metals	7/16/81	1:00
10	Nia. Sanitation i	well	TH0	7/16/81	1:00
11	7:	well	THO	7/16/81	12:00
12	Hilder Old Falls	well	THO	7/16/81	12:00
13	Artpark	Leachat <b>e</b>	Hetals	7/17/81	12:00
14	Artpark	Leachate	THO	7/17/81	12:00
15	PAŚNY _	Soil	Hetals	7/21/81	10:00
16	PASNY	Soil	THO	7/21/81	10:00
17	Nia. Sanitation	Soil	Metals	7/24/81	12:00
18	Nia: Sanitation	Soil	THO	7/24/81	12:00
19	Nia. Sanitation	Soil	Metals	7/24/81	12:00
20	Nia. Sanitation	Soil	THO	7/24/81	12:00
21	walck Road	Soil	THO	7/24/81	12:00
22	Grativick # 13	well	Phenol	8/12/81	10:00
23	Gratwick # 10	well	Phenol	8/12/81	10:00
24	Gratwick # 11	well	Phenol	8/12/81	10:00
25	Grativick # 12	well	Phenol	8/12/81	10:00
26	Zimmerman	well	Phenol	8/12/81	11:00
27	Old Falls	well	Phenol	8/12/81	11:00
28	[Nia: Sanitation	vell	Phenol	8/12/81	12:00
29	Olin-Industrial Welding	Soil	THO,TOC Lindane	9/07/81	12:00

## ANALYTICAL RESULTS FOR SAMPLES TAKEN AT GRATWICK - RIVERSIDE PARK

WELL # 10		
Sample # 2	Sampled 11:00	7/16/81
Cadmium, total Chromium, total Lead; total Mercury, total Nickle, total	L.T. 0.02 MG/L L.T. 0.1 MG/L L.T. 0.1 MG/L L.T. 0.4 MCG/L 0.05 MG/L	
Sample # 6	Sampled 11:00	7/16/81
тно :	35 MCG/L	
Sample #24	Sampled 10:00	8/12/81
Phenol	3 MG/L	
WELL # 11		
Sample # 3	Sampled 11:00	7/16/81
Cadmium, total Chromium, total Lead, total Mercury, total Nickle; total	L.T. 0.02 MG/L L.T. 0.1 MG/L L.T. 0.1 MG/L L.T. 0.4 MCG/L L.T. 0.05 MG/L	
Sample # 7	Sampled 11:00	7/16/81
тно -	Less than 1 MCG/L	
Sample # 25	Sampled 10:00	8/12/81
Phenol	3 MG/L	•
vELL # 12		
Sample # 4	Sampled 11:00	. 7/16/81
Cadmium, total Chromium, total Lead, total Wercury, total Wickle, total	L.T. 0.02 MG/L L.T. 0.1 MG/L L.T. 0.1 MG/L L.T. 0.4 MCG/L L.T. 0.05 MG/L	·
Sample # 8	Sampled 11:00	7/16/81
гно	4 MCG/L	
Sample # 26	Sampled 10:00	8/12/81
Phenols	0.2 MG/L	

## GRATWICK - RIVERSIDE PARK (continued)

## WELL # 13

Sampled 11:00 7/16/81 Sample # 1 0.02 MG/L L.T. Cadmium, total MG/L L.T. 0.1 Chromium, total 0.1 MG/L Lead, total Hercury, total 0.4 MCG/L L.T. 0.05 MG/L Nickle, total Sampled 11:00 7/16/81 Sample # 5 MCG/L 18 THO 8/12/81 Sampled 10:00 Sample # 22 MG/L 17 Phenols

## RESULTS OF SAMPLES TAKEN AT NIAGARA SANITATION SITE:

## WELL SAMPLES

Sampled 1:00 7/16/81 Sample # 9 MG/L 0.02 Cadmium, total L.T. Chromium, total L.T. 0.1 MG/L MG/L 0.2 Lead, total MCG/L 0.4 Hercury, total L.T. 0.12 MG/L Nickle, total Sampled 1:00° 7/16/81 Sample # 10 MCG/L THO 8/12/81 Sampled, 12:00 Sample # 28 0.008 MG/L Phenol

## ISOIL SAMPLES ,

Samples # 17,18,19 & 20 all Sampled 10:00 7/24/81 Samples # 17 & 18 Metals - Results not yet available Sample # 19 L.T. 10 PPB THO Sample # 20 L.T. 10 PPB THO

## RESULTS OF SAMPLES TAKEN AT ARTPARK

## LEACHATE SAMPLES

7/17/81 Sampled 1:00 Sample # 13 MG/L 0.02 Cadmium, total MG/L 0.1 Chromium, total MG/L 0.5 Lead, total 0.73 MG/L Nickle, total L.T. 0.4 MCG/L Hercury, total 7/17/81 Sampled 1:00 Sample # 14

THO 47 MCG/L

## RESULTS OF SAMPLES TAKEN AT HOLIDAY PARK

## WELL SAMPLES

**WELL # 4** 

Sample # 11(Zimmerman) Sampled 12:00 7/16/81

THO 4 MG/L

Sample # 26 Sampled 11:00 8/12/81

Phenols 2 .008 MG/L

WELL # 8

Sample # 12 (Old Falls) Sampled 12:00 7/16/81

THO 3 MCG/L

Sample # 27 Sampled 11:00 8/12/81

Phenol .01 MG/L

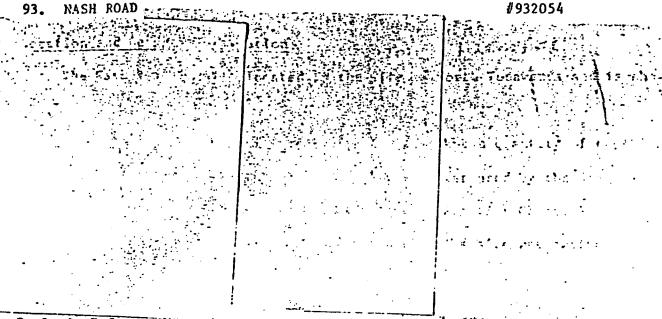
## SOIL SAMPLES

Sample # 21 Walch Road Sampled 12:00 7/24/81

THO Less than 10 PPB

NIAGARA SANITATION	Mohnult ver #365 FLE3
NASH ROAD SITE	S to I
(DEC # 932054)  - 12 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	
Approx. Scale.  1: 3600  (All distances estimated)  (All distances estimated)	SEES TO THE SOIL SOIL SAMFLES
100yd 0 100,d 200,d 0 100,d 0 100,d 0 100,d 0 100,d	TARE WELL TO HAW K
W - Marsh Area  { - Treeline    - Powerlines  L - Red - Brown Leachate  stains	ES - NIAGARA N
Slope - downward toward SE ((1%)	TREES POWER POWER LINE
Mapped from field observation only by Mi. Hopkins NCHD  Michael Hopkins	UNPAYED
NASH ROAD	

!



## Geologic Information

The geology of the site consists of a Holocene lacustrine clay unit overlying a bedrock of Camillus Shale. Four test borings were drilled on the site and their locations are shown in figure 1. The geologic description of the borings is as follows:

Well No.	Depth (ft)	Description
1/	0 - 5.0 5.0 - 6.5	Fill. Clay, pink. WATER SAMPLE: 6.0 ft.
2	0 - 8.0 8.0 - 10.0 10.0 - 11.5	Clay, tan to light green, sandy, dry. Clay, green. Clay, pink. SOIL SAMPLE: 8 - 10 ft.
Ö	0 - 1.5 1.5 - 3.5 3.5 - 7.0	Tan and black fill. Clay, greenish, sandy, dry. Clay, greenish, sandy, wet. SOIL SAMPLE: 7 ft.
4	0 - 1.0 1.0 - 3.5 3.5 - 6.5	Topsoil. Clay, sandy, dry. Clay, greenish, wet. SOIL SAMPLE: 6.5 ft.

Table 1 .-- Analyses of ground-water and substrate samples from Nash Road, Wheatfield, New York

	:	Sample r	number :	
	•			
	1 '	2.	3	4
Date collected	052482	052482	052482	062432
Depth (ft)	6.0	9.5	7.0	. 6.5
Sample Type1	gw	s	s	S
bH	6.4			• -
Conductivity (wHOS)	2650	-		<del></del> .
Temperature (°C)	17.0	-		. <del></del> .
Temperature ( o)	,,,,,			-
Inorganic Constituents <sup>2</sup>			,	
Antimony				
Arsenic	5;5	<1000;<1000	<1000	<1000
Cadmium	1;1	1000;1000 .	1000	1000
Chromium	<10;<10	2000;4000	2000	2000
	17;21	77000;100000	71000	71000
Copper Iron 90	000:90000	2500000;5000000	2100000	240000 <b>0</b>
Lead	67;74	20000;20000	13000	20000
	0.3;0.5	<10;<10	<10	<10 .
Mercury	34;34	<10000;<10000	<10000	<10000
Nickel	דענדע	(10000)		
Selenium			•	
Zinc				. •
Flouride				
Sulfide				
Cyanide	•			
Organic Compounds2			<300	<b>→</b>
1,2,3-trimethylbenzene	6.2;-7	-;-	· <300	
1,2,4-trimethylbenzepe	18;-7	_; <del>_</del>	<300	_
1,4-dichlorobenzene	7.3;-7	-;-		
(1-methylethyl)benzene	9.3;-7	;-	<300	•
1,3,3-Trimethyl-bicyclo	) <del></del>		/3M	_
[2.2.1]heptan-2-one4	62 <b>;</b> -7	-;-	<300	
1,7,7-Trimethyl-bicyclo	) <del></del>		<300	_
(2.2.1)heptan-2-one4	390;177	-;-	1)00	• *

<sup>1</sup> Sample type: Gw=ground water, sw=surface water, and s=substrate.

2 Concentrations: ug/L for water and ug/Kg for substrate. Blank spaces. indicate that no analyses were performed; dashes indicate that constituents and compounds were not found.

3 Cu(D): analysis done by direct aspiration because of high iron concentration. Identity determined by library metch; no standard available. Concentration

results are semiquantitative and are based on the response factor of the internal standard.

5 Identity based on loss than library match; identification seemed reasonable. As for footnote 4, concentration results are semiquentitative.

6 Volatile found in GC/ms extractions. Concentration results probably less then actual.

I low surrogate recoveries.

<sup>8</sup> Estimated value less than detection limit.

Table 1 .-- Analyses of ground-water and substrate samples from Nash Road, Wheatfield, New York

Sample Number

	1	2 .	3	4
Organic Compounds2 (continued)				
Iodocyclohexane 5	<b>-;-</b>	10052;-		
N-[2-methyl-1-(1-methylethyl)	) .	•	•	
butylidiene]methanamine5	_;_	36569;-		
N-(2 hydroethyl)-	•			
3.3		16342;-		-
1-(2-buteny1)-2,3- dimethylbenzene	•	•		
dimethylbenzene 5	-;-	1301;-		-
2,3,5,6,7,8,9,10-octahydri-	•	•		
5-hydroxy-2,2,7,7,9-			•	
pentamethy1-5,9-menthano-				
benzocycloocten-4(1H)-one4	-;-	6294;-		. –
10-methylcisosane 4	-;-	<300 <b>;</b> -	-	1300
Hexamethylcyclotrisiloxane5	-;-	- <b>;-</b>	_	1)00
Octamethylcyclotetra-				5440
siloxane 5	-;-	-; <del>-</del>		2440
Decemethylcyclopenta-				293 <sup>8</sup>
siloxane 5	- <b>;-</b>	-;-		237
Dodecamethylcyclohexa-				90.7
siloxane 5	-;-	-;		JO-1
5-liethyl-3-hexen-2-one	-;-	-;3500		<del>-</del> -
Dichloromethylbenzeneb	-;	-;<300	-	_
2-(1,1-Dimethyl)-4-		4.07.000		_
methylfuran5	-;-	-;183000	-	_
2,4-Dimethyl-2-pentene		-;182000		_
3-Octanol <sup>5</sup>		<b>-;</b> 47500	****	_
2,6-Bis(1,1-dimethylethyl)				•
napthalene5	-;-	<b>-;</b> 1650	_	-
1,1,4,5,5,8-Hexamethyl-S-		5050	<b>3</b>	. ,
hydrindaceneb	-;-	-;5750	~ _	<b>-</b>
Flouranthene	;-	-;538	. <del>-</del>	<del></del>
Benz(a)anthracene	-j- ···	-;2728	-	<del>-</del> .
Chrysene	-;-	-;274 <sup>8</sup>		-
Benzo(b)flouranthene	-;-	-;22 <del>3</del> 8		
Benzo(k)flouranthene	-;-	-;2498	-	<del></del>
2,6-Dimethyl-2,5-hepta-		•	500	
dien-4-one5	-;-	-;-	. 509	-
2-Methyl-2-octen-4-one <sup>2</sup>	-;-	-;-	13300	_
1,2,4-Trimethyl-5-(1-methyl-			450	• _
ethenyl)benzene5	-;-	-;-	159	<del>-</del> .
	•			

Sample type: gw=ground water, sw=surface water, and s=substrate.

5 Identity based on less than library match; identification seemed reasonable.
As for footnote 4, concentration results are semiquantitative.

6 Volatile found in GC/ms extractions. Concentration results probably less . : then actual.

<sup>2</sup> Concentrations: ug/L for water and ug/kg for substrate. Blank spaces indicate that no analyses were performed; dashes indicate that constituents and compounds were not found.

<sup>3</sup> Cu(D): analysis done by direct aspiration because of high iron concentration.
4 Identity determined by library match; no standard available. Concentration results are semiquantitative and are based on the response factor of the internal standard.

<sup>7</sup> Low surrogate recoveries.

<sup>8</sup> Istimated value less than detection limit.

Table 1 .- Inalyses of ground-water and substrate samples from Nash Road, Wheatfield, New York-continued

Sample Number

	•	•	Sembr	6 Minner		
•		1,	2	. 3	4	
Organic Compound	s2 (continue	ed)			•	
Jrganic Compound	hyl-bicyclo-					
[2.2.1]hep	dane-				•	
[2.2.1]110]	5	<5;20 <sup>7</sup>	-;-		<b>-</b>	
2.5-dione	harl of harl	1,7,1			•	
3-(1,1-dime	PHATE (HAT)	20;2.08	-:-			
pheno15	5	<5;-7	-:-	-		
2-methylben	rochrotiae	(2.9.07		-	-	
Dietnylphun	dia ve	6.2;8.07	,			
Phosphoric	acıd, _	40-1107	•		-	
t.ributv1e	ster	10;1107	• •		***	
2(3H)_benzo	th182010116	<5;60 <sup>7</sup>	-,-	-		
ni_n_hutvlt	hthalate	$2.5^{8};5.7^{7}$	-;-			
1 2 3 4 42.	9,10,10a-		•			
octsbydro	-1.4a-					
-ludtamis	7-(1-methyet	:hy1 <b>)</b> -		•		
[1R_(1 a]	pha, 4a beta	1,				
10a alpha	37.					
1 phonon	prenecarbox-	•	•			
1-bueimi	5	<5;1.5 <sup>8</sup>	-;-	-		
aldenyde	Thalate 5	2.68;-7	-;-	-	_	•
Cyclonexlpl	Tulatare 5	-;117	-; -	-	_	• .
3,5-Dimeth	AT buenor	, · ·	•			
2-ethy1-4-1	phenoldelt	<b>a.</b>			•	
2-1,3,4-	5	-;100 <sup>7</sup>	<b>-:-</b> .			
ozadiezo	lin-5-one-	-,100	,			
n-butylben	zene <sub>s</sub> .	.0.07	<b></b> -	<u></u> ·		
7 4 0000	100 -	-;9.97	: -, -,-	· _	-	
3_(2-pheny	lethyl)pheno	-;2.18	-,-	<u> </u>	-	
2H-1-benzo	pyraif b	3 . –	-,-	-		
2_methylps	ntadecane5	-;<5 <sup>7</sup> ·	-;-			
Heptadecar	ie5	-:<5!	-;-			•
Octacosane	5	-;<5 <sup>7</sup>	-;-			
4,8,12-Tri	mathul-3.			•		
4,0,12-11		•				
	ADCOTT ONE-		_	_		
7,11-tri	decatriene-	<b>−:</b> <5 <sup>7</sup>	-;-		_	
nitrile	,4 <sup>)</sup>	-;<5 <sup>7</sup> -:<5 <sup>7</sup>	-;- -;-	-	-	
nitrile	25	-:<5 <sup>7</sup>	-;- -;- -:-	- -	-	
nitrile Nonadecano	ovlundecane <sup>5</sup>	-;<5 <sup>7</sup> -;<5 <sup>7</sup>	-;- -;-		-	
nitrile Nonadecand 3,8-Dimet	,4 <sup>)</sup>	-;<5 <sup>7</sup> -;<5 <sup>7</sup> ethyl-	-;- -;- -;- 804;-	- -	- -	

<sup>1</sup> Sample type: Greground water, swesurface water, and sesubstrate.

<sup>2</sup> Concentrations: ug/L for water and ug/Kg for substrate. Blank spaces indicate that no analyses were performed; dashes indicate that constituents

<sup>3</sup> Cu(D): analysis done by direct aspiration because of high iron concentration. 4 Identity determined by library match; no standard available. Concentration results are semiquantitative and are based on the response factor of the

<sup>5</sup> Identity based on less than library match; identification seemed reasonable. As for footnote 4, concentration results are semiquentitative.

<sup>6</sup> Volatile found in GC/rs extractions. Concentration results probably less then ectual.

<sup>7</sup> Low surrounte recoveries.

<sup>8</sup> Patiented value less than detection limit.

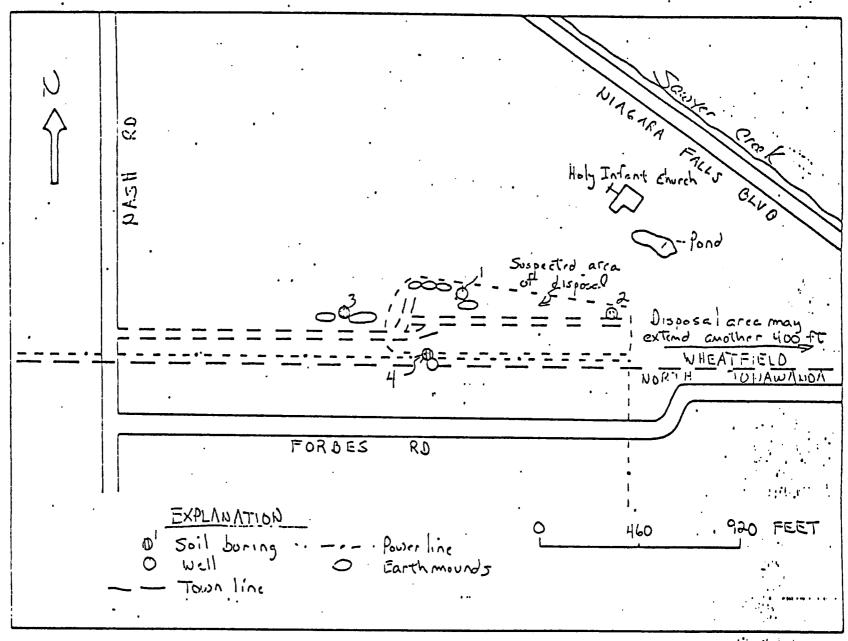


Figure 1. Location of sampling cites on the Nash Road property.

# POTENTIAL HAZARDOUS WASTESITE

LIDENTIFICATION

01 STATE | 02 STENUMBER

	OCATION AND I	NSPECTION INFO	RMATION NY 10	00005]4380
II. SITE NAME AND LOCATION.				
01 SITE NAME (Legal common, or paricipore numero) stee	•	2 STREET, ROUTE NO., C	R SPECIFIC LOCATION INCENTIFIER	
Nash Road Landfill		Nash Road	C6 COUNTY	OTCOLINTY DE CONG
escry		A STATE OS ZP CODE		COCE ST
Town of Wheatfield		NY 14150	Niagara	
43° 04" 10" 0" 78° 51° 33 8"	TYPE OP OWNERSHIP O A PRIVATE C OF OTHER —	B. FEDERAL	C C STATE C D. COUNTY	E MUNICIPAL
IIL INSPECTION INFORMATION  ON OATE OF INSPECTION   02 SITE STATUS   02	TYEARS OF OPERATION	·N		
OT DATE OF INSPECTION OR STE STATUS OF A/28 / 83		964 r 1968	UNKNOWN	
WORTH DAY TEN		ING YEAR ENDING		
04 AGENCY PERFORMING INSPECTION (Cheer of the story)	- 0	_		
CAPA CARACONTRACTOR Engineerin	nd Science	C MUNICIPAL CI	D. MUNICIPAL CONTRACTOR	(Name of Time -
CESTATE OF STATE CONTRACTOR Dames & Mo		O G OTHER	Sovery	
OS CHIEF INSPECTOR	OS TITLE	-	Engineering	08 TELEPHONE NO. 703/591-7575
John Kubarewicz	Chemical	Engineer	Science	
09 OTHER INSPECTORS	Geologist		Dames & Moore	12 TELEPHONE NO. 315/638-2572
Art Seanor	Geologist			
	·			( , )
				( ).
				1 )
		•		
13 STE BERGE SENTATIVES INTERVIEWED	147015	15ACCRESS		16 TELEPHONENO.
13 STEARPRESENTATIVES WIERWED C. Ed Greinert	City Superv		tfield	
	· -		· ·	( )
				( )
				( )
				( )
				1,
	19 WEATHER COND	TONG		
17 ACCESS GLANED BY 18 TIME OF INSPECTION  IN PERMISSION 15:00	sunny			
IV. INFORMATION AVAILABLE FROM	•	· .		
orconact Ernie Schroeder	02 CF PARTIES	ing Science		404/325-0770
04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	IOS AGENCY	08 CRGAMZATION	G7 TELEPHONE NO.	CB CATE
Eileen Gilligan		Dames & Moo	re 315/638-2572	8 10 84 

## POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

LIDENTIFICATION DI STATE CZ SITE NUMBER

WE!	A		PART 2- WASTE	INFORMATION		NY 100005	14 380
I WASTESTA	TES, QUANTITIES, AN	D CHARACTER	STICS	·			
E A SOUD C B POWDER.	TES ICHEL MUNICIPALITY	O2 WASTE CUANTI DE STANDARDO TONS _	TY AT SITE  WASTE CONTROLS  TO BE OF THE TENTE OF T	C3 WASTE CYARACTE  II A TOXIC  II B. CORROS  II C. PALIOAU  II D. PERSIST	CTIVE B'G FLAMM	E C I, HIGHLY VO OUS C J. EXPLOSIV ABLE C K, FEACTIVE	E TIBLE
C D. OTHER _	(Sivecity)	NO, OF DRUMS	ļ		·		
		1,0.0.0.0.	,				
IIL WASTE TY	SUBSTANCE N	LAME .	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS		
SLU	SLUDGE						
OLW	OILY WASTE						
SOI	SOLVENTS						
PSD	· PESTICIDES						
- (SCG)	OTHER ORGANIC C	HEMICÁLS	900 cu. y	is.	Chemical w	aste/ Love Ca	nal
100	INCRGANIC CHEMIC						
ACD	ACIDS				<u> </u>		
BAS .	BASES						
(MES )	HEAVY METALS				lead, chron	mium, plating	sludge
	OUS SUBSTANCES (See	Appendix for most frequen	my cred CAS Humbertal				OR MEASURE OF
01 CATEGORY	02 SUBSTANCE		03 CAS NUMBER	04 STCRAGE/DIS	POSAL METHOD	C5 CONCENTRATION	DE MEASURE OF
MES	lead		999	landfill		67-20,000	ppb
	2,4, dimeth	v1 2 pente	ne 999	landfill		182,000	ppb
occ	2-(1,1 dime	<u>yr 2 pence</u> +hv1\-4-	999	landfill		183,000	dqq
occ	methylfuran			landfill			
occ	phenol		108-95-2	landfill		1,000	mg/1
OCC MES	mercury	· · · · · · · · · · · · · · · · · · ·	7439-97-6	landfill	•	0.5	ppb
SOL	benzene		71432	landfill			<u> </u>
<u> </u>		•	108883	landfill			
SOL	toluene methylene c	hlorido	999	landfill			<del> </del>
SOL	dichloroben		25321-226		•		-
OCC	tetrachlori		999	landfill			<u> </u>
occ	trichloroet		127184	landfill			
- occ	trichloroet		999	landfill			
occ	hexachlorob		87683	landfill		-	<del>  -</del>
	110210011110					<del> </del>	
	OCX S ISee Accepted for CAS M.						
<b>!</b>		OCX NAME	02 CAS NUMBER	CATEGORY	01 FEEDS	TOCK NAME	02 CAS NUMBE
CATEGOR			7439-97-6	FDS			<u> </u>
FDS	mercury			FDS			<del> </del>
FDS				FDS			<del> </del>
FDS		•		FDS			1
<b></b>	ES OF INFORMATION	Can specific references.	L.C., TIME FINE, SUPPLY WHAT HE	e. 1400(TS)			
VI. SOURC	Investigation	of Sologto	I Inactive To	oxic Landfi	lls in conju	nction with t	the Niagar
1.)	Investigation (	OT SETECTE	4 1114CC2+C 1.	= e-r= =			

- River Study," Aug. 1981, (U.S.G.S.)
- 2.) Memo to Hennesey NYSDOT, 8/9/78
- Letter to Caine NYSDOT from Hooker, 5/9/68 3.)



## POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

I. IDENTIFICATION

01 NY 1 6000 514 PART 3-DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDEN' II. HAZERDOUS CONDITIONS AND INCIDENTS 01 & A GROUNDWATER CONTAMINATION 02 & OBSERVED (DATE: \_7/24/81 ) C POTENTIAL C ALLEGED 03 POPULATION POTENTIALLY AFFECTED: **C4 NARRATIVE DESCRIPTION** Well sampling shows contamination by lead and organic chemicals. 01 Q/B. SURFACE WATER CONTAMINATION 02 I OBSERVED (DATE: \_7/83 O POTE/ITIAL ☐ ALLEGED 03 POPULATION POTENTIALLY AFFECTED: 04 NARRATIVE DESCRIPTION Rust colored red stains in standing water and soil. Chemical analyses show low levels of methylene chloride and TOX. OT C. CONTAMINATION OF AIR 02 ST CBSERVED (DATE: 7784 O POTENTIAL □ ALLEGED 03 POPULATION POTENTIALLY AFFECTED: C4 NARRATIVE DESCRIPTION None. 01 C D. FIRE/EXPLOSIVE CONDITIONS 02 E CESERVED (DATE: 7/84 E POTENTIAL C ALLEGED 03 POPULATION POTENTIALLY AFFECTED: 04 NARRATIVE DESCRIPTION Small fire of unknown origin burning unattended. 01 CE DIRECT CONTACT 02 ST OBSERVED (DATE: 7/84 G POTENTIAL □ ALLEGED ~100 03 POPULATION POTENTIALLY AFFECTED-**04 NARRATIVE DESCRIPTION** Site used by local residents as play area. Q1 TO F. CONTAMINATION OF SOIL 02 @ OBSERVED (DATE: 7/24/81 POTENTIAL ☐ ALLEGED 03 AREA POTENTIALLY AFFECTED: 04 NARRATIVE DESCRIPTION Soil samples show metal and organic contaminat (on. 01 D G. DRINKING WATER CONTAMINATION 02 CESERVED (DATE: POTENTIAL C ALLEGED 03 POPULATION POTENTIALLY AFFECTED: 04 NARRATIVE DESCRIPTION No. 01 E H. WORKER EXPOSURE/INJURY 02 C OBSERVED IDATE: E POTEVIAL C ALLEGED 03 WORKERS POTENTIALLY AFFECTED: 04 NARRATIVE DESCRIPTION None. 01 CI. POPULATION EXPOSURE/INJURY 02 C OBSERVED (DATE: TE POTENTIAL T ALLEGED ~100 03 POPULATION POTENTIALLY AFFECTED: \_ 04 NARRATIVE DESCRIPTION No known injuries.

I. IDENTIFICATION POTENTIAL HAZARDOUS WASTE SITE 01 STATE 02 SITE NUMBER SITE INSPECTION REPORT NY 0000514380 PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS IL HAZARDOUS CONDITIONS AND INCIDENTS (Construed) 01 DAMAGE TO FLORA 02 E CESERVED (DATE: \_\_\_7/84\_ C POTENTIAL C ALLEGED 04 NARRATIVE DESCRIPTION None observed. 01 G K DAMAGE TO FAUNA 02 E CESERVED (DATE: \_ C ALLEGED 04 NARRATIVE DESCRIPTION INCLOS NAMES OF SO Abundant small animal wildlife on site. No damage observed. 01 TL CONTAMINATION OF FOOD CHAIN 02 C CESERVED (DATE: \_\_\_ TE POTENTIAL C ALLEGED **04 NARRATIVE DESCRIPTION** Potential to aquatic microorganisms in ponds and trenches 01 DV M. UNSTABLE CONTAINMENT OF WASTES 02 CBSERVED (DATE: 4/28/83) . PCTENTIAL C ALLEGED 04 NARRATVE DESCRIPTION 7/83 03 POPULATION POTENTIALLY AFFECTED:\_ Pools of orange tinted standing water observed, rubbish protruding from earth. 02 CBSERVED (DATE: \_\_\_ 01 TO N. DAMAGE TO OFFSITE PROPERTY C POTENTIAL **ALLEGED** 04 NARRATIVE DESCRIPTION None. 01 [] O. CONTAMINATION OF SEWERS, STORM BRAINS, WWTPS 02 [] CBSERVED (DATE: \_ C ALLEGED 04 NARRATIVE DESCRIPTION None. 02 1 OBSERVED (DATE: 6/11/81) 01 TP. ILLEGAL'UNAUTHORIZED DUMPING C POTENTIAL I ALLEGED 04 NARRATIVE DESCRIPTION Niagara County DOH observed "evidence of dumping" after site closed. 05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS IIL TOTAL POPULATION POTENTIALLY AFFECTED: unknown IV. COMMENTS Per NYSDEC instruction, Phase II study did not address extent of Therefore, total population potentially affected cannot contamination. be determined. V. SOURCES OF INFORMATION (Cre specific references, e.g., state trial, sample energial, reporter

- 1.) Niagara County DOH 1981
- 2.) U.S.G.S. Study, 1982/83
- 3.) Site visits during Phase II investigations

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## POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION

I. IDENTIFICATION					
O1 SZÁTE	CS SUE ATTABEM				
NY   0000514380					

CELITY	PART4-PERMI	T AND DES	SCRIPT	IVE INFORMATI	on <sup>L</sup>	_NY_[_0000514380
II. PERMIT INFORMATION						
01 TYPE OF FERMIT ISSUED	Not	O3 DATE IS	SUED	G4 EXPIRATION DATE	05 CCHMENTS	
□ A. NPDES	applicable	Ì				•
E B. UIC						
□ C. AIR		- i				
D. RCRA				i		
DE RCRAINTERIM STATUS	<del></del>					
IF. SPCC PLAN	<u> </u>					
C. G. STATE (Scordy)						
☐ H. LOCAL (Sc+=M)						
DI. OTHER (So-con)					)	
						•
O.L. NONE	<u> </u>	<u>. l.·</u>	!		<u> </u>	
OI STORAGE/DISPOSAL (Chica of that according to the control of the	TINUEC TRUCKS	OF MEASURE	64 700	17151F1G		05 OTHER
	E AMOUNT US DAIL!	OF MEASURE	04 176	EATMENT (Check of their ac	SCP)	GEOTHER
A SURFACE IMPOUNDMENT		<del></del>		NCENERATION		D A. BUILDINGS ON SITE
D B. PILES	· · · · · · · · · · · · · · · · · · ·	<del></del>		INDERGROUND INJE		
D. TANK, ABOVE GROUND				CHEMICAL/PHYSICA	L	
D E JANK BELOW GROUND				BIOLOGICAL VASTE OIL PROCES!	SING	08 AREA OF SITE
	ınknown		l.	OLVENT RECOVERY		
C G LANDFARM				OTHER RECYCLING		7 (2004)
☐ H. OPEN DUMP	· · · · · · · · · · · · · · · · · · ·		_	OTHER None		
C) I, OTHER				1St+	c <b>r</b> yj	·
07 CCMMENTS		<del></del>	L			
Poorly close	ed; tires, met	al, oth	er ru	abbish visib	ole	
·						
IV. CONTAINMENT						
01 CONTAINMENT OF WASTES (Charact one)		<b></b>			<u></u>	
C A ADEQUATE, SECURE	C B. MODERATE	□ C. IN	IADEQU	ATE, POOR	DA D. INSECU	IRE, UNSOUND, DANGEROUS
C2 DESCRIPTION OF DRUMS, DIKING, LINERS, BA						
1.) Poorly close	ed; tires, met	al, oth	er rı	ıbbish visib	ole.	
2.) Disposal tre	ench for Love	Canal w	aste	excavated i	n soft,	layered clay.
	ed barriers in					
V. ACCESSIBILITY  OI WASTE EASILY ACCESSIBLE: TYES	(INO					·
02 COMMENTS						
Unfenced, e	asy access					
M COURCES OF INCOME TION -						•
VI. SOURCES OF INFORMATION (Careson	•		⊃/1 <b>8.</b> ]			
	tion, summer l					
2.) Memo to Henr	nesey NYSDOT,	8/9/84				

POTENTIAL HAZARDOUS WASTE SITE  SITE INSPECTION REPORT  II. DRINKING WATER SUPPLY  OF THE POTENTIAL SUPPLY  OF THE POTENT										
SITE INSPECTION REPORT  PARTS - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA  III. DRINKING WATER SUPPLY  OF THE OF EXAMPLES SUPPLY  OF THE OF THE OF EXAMPLES SUPPLY  OF THE OF THE OF EXAMPLES SUPPLY  OF THE OF THE OF EXAMPLES SUPPLY  OF T					DOUG W			I. IDEN	TIFICATION	
DAINNING WATER SUPPLY  OF THE OF DETRICATION SUPPLY  OF SURFACE  SURFACE  SURFACE  WELL  ENDANGERED  A B D C D A Imm  NON-COMMUNITY  A C B D A D D D C COMMERCIAL PRODUCTION  III. GROUNDWATER  OF COMMENTY  OF COMME	SIDA		POI				<b>E</b> .		. – .	_
II. DRINKING WATER SUPPLY  O1 TYPE OF DENNING SUPPLY  SURFACE  WELL  BIDANGERED AFFECTED MONITORED  COMMUNITY  A C B B B A B C C B A MINING  NON-COMMUNITY  C C D B B B A B C C B B B MINING  O1 GROUNDWATER  O1 GROUNDWATER  O1 A CHRY SCURTE FOR DRINKING  CAPPELLATION SERVED BY GRYUND WATER A COMMUNITY COMMU	COLLINA		PART 5 - WATER				ENTAL DATA	NY	1 000051438	<u> </u>
OI TYPE OF ERRINAND SUPPLY  COMMUNITY  SURFACE  WELL  BICANDERED  A B.D. C.D.  A	IL DRINKING WATER ST							•		
SURFACE WELL ENDANGERED AFFECTED MONTORED  COMMUNITY A B B D A D B D C D B D G D G D G D G D G D G D G D G D G				1				03.0	STANCE TO SITE	
COMMUNITY A. C. B. D. A. B. C.		.т	•	02 S/A/US				""		
NCN-COMMENTY  C. C. D. D. E. D. F. D. B					-			Ì.		
DI GROUNDWATER  OI GROUNDWATER USE NYCHITY (Struct and Manager of Commence of	=	·		1		_		\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \		
OL CHANGE AFEA  OL DESCRIPTION OF WELLS INCLUDED SOUNCE AFFECTED BOOKS OF WATER  OL SURFACE WATER USE AVERAGE AREA  OL SU	NON-COMMUNITY	C. Li	0. U	0.0			<u>r. U</u>	B	1118)	
DA ORLY SCURCE FOR CRINNAD  DE PROMOTOR  COMMENCED I PRODUCTION DEPOSITE AND DESTRUEL BRIGATION  COMMENCED I PRODUCTION DEPOSITE AND DESTRUEL BRIGATION  COMMENCED I PRODUCTION DEPOSITE AND DESTRUEL BRIGATION  OF DEPTH TO GROUNDWATER  4.0 (m) SW, S, SE OF COMMENTS  OF COMMENTS  Network of sampling wells varying from 10' to 70' in depth  located throughout the landfill  10 RECHARGE AREA  DYES COMMENTS  DNO  N. SURFACE WATER SOURCE FOR EACH OF PRODUCT OF COMMENTS  NO SURFACE WATER OF COMMENTS  DNO  OZ AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER  NAME:  Small pond on site  Small po										
COMMERCIAL NOUSTPIAL PRICATION  C2 POPULATION SERVED BY GAYOUND WATER 0	O1 GROUNDWATER USE IN VI	CINITY (Ch+== o	ne)	,						
O2 POPULATION SERVED BY GROUND WATER D O3 DISTANCE TO NEAREST DRINKING WATER WEIL O.2 [mil]  O4 DEPTH TO GROUND WATER O5 DISECTION OF GROUND WATER FLOW OF CONCERN OF	A CHILY SCURTE FOR	DRINKING		<b>\54</b> 1				TION DE	D. NOT USED, UNUSE	BLE
O2 POPULATION SERVED BY GYOUND WATER			COMMERCIAL	NOUSTPIAL IFRIGATIO		•				
OS DESCRIPTION SERVED STATES OF DIRECTION OF GROUNDWATER FLOW SW, S, SE  4.0itt)  Network of sampling wells varying from 10' to 70' in depth located throughout the landfill  10 RECHARGE AREA  CYES COMMENTS  IN. SURFACE WATER  01 SURFACE WATER 01 SURFACE WATER SITE STORE  10 SURFACE WATER SITE ON SERVICE BOOKS OF WATER  NAME:  Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  01 IOTAL FOPULATION WITHIN  ONE (11 MILE OF SITE TWO (2) MILES OF SITE THREE (3) MILES OF SITE  A 1.800					·.				·	
ON DESCRIPTION OF MALES OF SAME OF SAM	The second control of	CBO WO WIT	<del></del> ∩		03 DISTANC	ETO NEARES	ST DRINKING WATER	WELL	0.2 <u>(mi)</u>	
A.O					<del> </del>		<del></del>	<del></del>	AS SOLE SOLECE AO	NEER
Network of sampling wells varying from 10' to 70' in depth located throughout the landfill    10 RECYLARGE AREA		R	ł ·		OF CONC	ERN		1		
Network of sampling wells varying from 10' to 70' in depth located throughout the landfill  10 RECHARGE AREA  11 DISCHARGE AREA  12 YES COMMENTS  10 NO  11 SURFACE WATER  11 SURFACE WATER  12 SURFACE WATER  13 SURFACE WATER USE ICHO SOW!  14 A. RESERVCIA, RECREATION DRINKING WATER SOURCE  15 SAW WATER SOURCE  16 SAWYER TO SUFF  17 SAWYER Creek  18 Bull Creek  19 C. COMMERCIAL INDUSTRIAL  10 D. NOT CURRENTLY USED  11 DISCHARGE AREA  12 YES COMMENTS  10 C. COMMERCIAL INDUSTRIAL  11 DISCHARGE AREA  12 YES COMMENTS  12 C. COMMERCIAL INDUSTRIAL  13 D. NOT CURRENTLY USED  14 DISTANCE TO SUFF  15 SAWYER CREEK  16 DISTANCE TO SUFF  17 SAWYER CREEK  17 DIAWANDA CREEK  18 C. 12 JOOO  18 DISTANCE TO NEAREST POPULATION  18 C. 12 JOOO  18 DISTANCE TO NEAREST POPULATION  18 DISTANCE TO NEA	4.0	_(#).	SW,S,	SE	~4.0	) (ft)		_(gpq)	LITES UZ	NO
ID RECHARGE AREA  IN SURFACE WATER  OI SURFACE WATER  OI SURFACE WATER  OI SURFACE WATER USE(ON-DOWN)  BY A. RESERVOIR, RECREATION IMPORTANT RESOURCES  OZ AFFECTED/POTENTIALLY AFFECTED BODICS OF WATER  NAME:  Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  OI TOTAL FOPULATION WITHIN  ONE (1) MILE OF SITE  A 1.800  B. 6,100  C. 12,000  III DISCHARGE AREA  II CISCHARGE AREA  II COMMENTS  OC COMMENTS  II	09 DESCRIPTION OF WELLS	incliding usesne	sents, and location neutres t	o population and buildings)					•	
ID RECHARGE AREA  IN SURFACE WATER  OI SURFACE WATER  OI SURFACE WATER  OI SURFACE WATER USE(ON-DOWN)  BY A. RESERVOIR, RECREATION IMPORTANT RESOURCES  OZ AFFECTED/POTENTIALLY AFFECTED BODICS OF WATER  NAME:  Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  OI TOTAL FOPULATION WITHIN  ONE (1) MILE OF SITE  A 1.800  B. 6,100  C. 12,000  III DISCHARGE AREA  II CISCHARGE AREA  II COMMENTS  OC COMMENTS  II		Netwo	rk of sample	ing wells w	arvina	From	10' to 70'	in de	pth	
11 DISCHARGE AREA  (EVES COMMENTS  (I) NO  IV. SURFACE WATER  O1 SURFACE WATER  O1 SURFACE WATER  O1 SURFACE WATER USE (CHOS) ONE)  WA. RESERVOIR, RECREATION IMPORTANT RESOURCES  O2 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER  NAME:  Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  O1 TOTAL POPULATION WITHIN  ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (2) MILES OF SITE  A 1.800  B 6,100  C. 12,000  C. 12,000  OMMENTS  COMMENTS  C	100						10 00 .0		<u> </u>	
DYES COMMENTS D NO.  IV. SURFACE WATER  OI SURFACE WATER  OI SURFACE WATER USE (ON-SOME)  BY A RESERVCIR, RECREATION IMPORTANT RESOURCES  OZ AFFECTED/POTENTIALLY AFFECTED BODICS OF WATER  NAME:  Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  OI TOTAL POPULATION WITHIN  ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (2) MILES OF SITE A 1.800  BY OMMENTS  COMMENTS  C	100	aceu cii		c imidiii.						
DYES COMMENTS D NO.  IV. SURFACE WATER  OI SURFACE WATER  OI SURFACE WATER USE (ON-SOME)  BY A RESERVCIR, RECREATION IMPORTANT RESOURCES  OZ AFFECTED/POTENTIALLY AFFECTED BODICS OF WATER  NAME:  Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  OI TOTAL POPULATION WITHIN  ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (2) MILES OF SITE A 1.800  BY OMMENTS  COMMENTS  C					11 DISCHAR	GE AREA		<del></del>	<del>.</del>	
IV. SURFACE WATER  OI SURFACE WATER  OI SURFACE WATER USE (CN-CH ONL)  PA. RESERVOIR, RECREATION B. IRRIGATION, ECONOMICALLY D. C. COMMERCIAL, INDUSTRIAL D. NOT CURRENTLY USED  OZ AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER  NAME:  Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  OI TOTAL POPULATION WITHIN  ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (2) MILES OF SITE  A 1.800 B 6,100 C. 12,000 350 I	1 / 1		·		i :	i i	rs			
IV. SURFACE WATER  OI SURFACE WATER USE ICHARDON  BY A. RESERVOIR, RECREATION  ORINKING WATER SOURCE  OZ AFFECTED/POTENTIALLY AFFECTED BODILS OF WATER  NAME:  Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  ONE (11) MILE OF SITE  TWO (2) MILES OF SITE  THREE (32.MILES OF SITE  350 I	1 _ ' 1				D NO					
O1 SURFACE WATER USE/CHAS OFF!  B A. RESERVOIR, RECREATION DRINKING WATER SOURCE IMPORTANT RESOURCES  O2 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER  NAME: Small pond on site Sawyer Creek Bull Creek Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  O1 TOTAL POPULATION WITHIN  ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (2) MI					J	J	<del></del>			
BA. RESERVOIR, RECREATION DRINKING WATER SOURCE BOOKS OF WATER  O2 AFFECTED/POTENTIALLY AFFECTED BOOKS OF WATER  NAME:  Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  O1 TOTAL POPULATION WITHIN  ONE (1) MILE OF SITE  TWO (2) MILES OF SITE  THREE (3) MILES OF SITE  THREE (3) MILES OF SITE  THREE (2) MILES OF SITE  THREE (3) MILES OF SITE  THREE (4) MILES OF SITE										
DRINKING WATER SOURCE IMPORTANT RESOURCES  O2 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER  NAME: Small pond on site Sawyer Creek Bull Creek Tonawanda Creek Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  O1 TOTAL POPULATION WITHIN  ONE (1) MILE OF SITE A 1.800 B 6,100  TWO (2) MILES OF SITE THREE (2) MILES OF SITE A 1.800  TOTAL POPULATION  O1 TOTAL POPULATION  THREE (2) MILES OF SITE A 1.800	01 SURFACE WATER USE ICH	ect onej					•			
O2 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER  NAME: Small pond on site Sawyer Creek Bull Creek Tonawanda Creek Tonawanda Creek V. DEMOGRAPHIC AND PROPERTY INFORMATION  O1 TOTAL POPULATION WITHIN ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (3) MILES OF SITE A 1.800 B. 6,100 C. 12,000  AFFECTED DISTANCE TO SITE OLSTANCE TO SITE AFFECTED OLSTANCE TO SITE OLSTANCE TO SITE O2 DISTANCE TO NEAREST POPULATION  THREE (3) MILES OF SITE A 1.800 B. 6,100 C. 12,000  AFFECTED OLSTANCE TO SITE O2 DISTANCE TO NEAREST POPULATION  THREE (3) MILES OF SITE O2 DISTANCE TO SITE O2 DISTANCE TO SITE O3 DISTANCE TO SITE O3 DISTANCE TO SITE O3 DISTANCE TO SITE O4 DISTANCE TO SITE O5 DISTANCE TO					Y DC	COMMERC	AL INDUSTRIAL	0.0	). NOT CURRENTLY	USED
NAME:  Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  One (1) Mile of Site  A 1.800  B 6,100  C 12,000  AFFECTED  DISTANCE TO SITE  0.25 (mi)  (mi)  C.23 (mi)  DISTANCE TO SITE  1.1 (mi)  C.33 (mi)	DHINKING WATE	SOUNCE	. IMPORTA	ATT NESCOTIONS						
Small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  One (1) Mile of Site  A 1.800  B 6,100  C 12,000  O.25 (mi)  1.1 (mi)  2.3 (mi)  Oz DISTANCE TO NEAREST POPULATION  ONE (2) MILES OF SITE  A 1.800  B 6,100  C 12,000  O.25 (mi)  I (mi)  C 1.2 (mi)  D.2 DISTANCE TO NEAREST POPULATION  OX DISTANCE TO NEAREST POPULATION	02 AFFECTED/POTENTIALLY	AFFECTED 60	DDIES OF WATER							
small pond on site  Sawyer Creek  Bull Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  One in the continuous contin	NAME:		• •				AFFECTE	ם	DISTANCE TO SITE	=
Bull Creek Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  OI TOTAL FOPULATION WITHIN  ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (3) MILES OF SITE A 1.800 B. 6,100 C. 12,000 350 I	small po	nd on s	ite							
Tonawanda Creek  Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  11 TOTAL POPULATION WITHIN  ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (3) MILES OF SITE A 1.800 B. 6,100 C. 12,000 350 I	Sawyer C	reek	•							
Tonawanda Creek  V. DEMOGRAPHIC AND PROPERTY INFORMATION  01 TOTAL FOPULATION WITHIN  ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (3) MILES OF SITE A 1.800 B. 6,100 C. 12,000 350 1	Bull Cre	ek								
ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (3) M									2.3	(1.11)
ONE (1) MILE OF SITE TWO (2) MILES OF SITE THREE (3) MILES OF SITE (2) MILES OF SITE (3) MILES OF SITE (2) MILES OF SITE (3) MILES OF SITE (4) MILES OF SITE										
	01 TOTAL POPULATION WITH	HIN				٥	2 DISTANCE TO NEA	REST POPL	JLATION	
		TV	VO (2) MILES OF SITE	THREE	(3) MILES OF	SITE		250		
	A 1.800	E	3. 6,100 N. OF PERSONS	c	NO. OF PERSON	<u>-</u>	-	330	·	

04 DISTANCE TO NEAREST OFF-SITE BUILDING .

350'

Site is located adjacent to a suburban housing development.

US POPULATION WITHIN VICINITY OF SITE, Promos navistive casciption of nature of population within within within vicinity of see, e.g., Line, visige, containly populated urban areal

B. 6, LUU

NO OF PERSONS

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

1620\_

## OFFI

## POTENTIAL HAZARDOUS WASTE SITE

1. IDENTIFICATION O1 STATE C2 SITE NUMBER

<b>56171</b>	PART 5 - WATER, DEMOGRAPHI		DATA NY 000514 380
VI. ENVIRONMENTAL INFORM	NOITAN		
O1 PERMEABILITY OF UNSATURATED	DIZONE (Check one)	<i></i>	
· □ A. 10 <sup>-6</sup> – 10	0-6 cm/sec B. 10-4 - 10-6 cm/sec 12	C. 10 <sup>-4</sup> - 10 <sup>-3</sup> cm/sec □ D.	GREATER THAN 10-3 cm/sec
02 FERMEABILITY OF BEDHOCK (C)	•		
C A, IMPEI	RMEABLE O.B. RELATIVELY IMPERMEABL an 10 <sup>-6</sup> presect (10 <sup>-4</sup> - 10 <sup>-6</sup> cressect	E VC. RELATIVELY PERMEAB	LE C.D. VERY PERMEABLE (Green than 10 <sup>-2</sup> cm seq)
D3 DEPTH TO BEDROCK	04 CEFTH OF CONTAMINATED SCIL ZONE	05 SOIL pH	
~ 70 (n)	unknown(#)	5.6-7.3	
CE NET FREC:PITATION	07 ONE YEAR 24 HOUR RAINFALL	CE SLOPE   DIRECTION	OF SITE SLOPE TERRAIN AVERAGE SLOPE
$40 - 27 = 13_{(in)}$	(in)		E 1.0 %
CS FLOOD POTENTIAL	10		
SITE IS IN 7,500 YEAR F	ROODPLAIN . IS SITE IS ON EARRIS	ER ISLAND, COASTAL HIGH HAZZ	ARD AREA, RIVERINE FLOODWAY
11 DISTANCE TO WETLANDS (5'20'0 C	N'ATTENTS	12 DISTANCE TO CRITICAL HABITAT	(0) endangered scecieti
, ESTUARIN <b>E</b>	OTHER		3.5 (mi)
A(mi)	83.5 (mi)	ENDANGERED SPECIES:	Peregrine Falcon, Golden E.
13 LAND USE IN VICINITY			
CISTANCE TO:	RESIDENTIAL AREAS; NATION	NALUSTATE FARKS.	AGRICULTURAL LANDS ME AG LAND AG LAND
COMMERCIALINDUS	HIAL FORESTS, ON WILDUF		in Ad Live
A(r	mi) B	(mi) C	0.01 (mi) D(mi)
14 DESCRIPTION OF SITE IN RELATIO	ON TO SURROUNDING TOPOGRAPHY		
site	Site is located in a flat, was a swamp, with drainage	poorly drained ar to the North.	ea. Prior to dumping,
	•		
•	•		
	•		•
·			
		•	
·		•	
	•		
	·	•	
	•		
VIL SOURCES OF INFORMAT	TION ICTO apocate references, e.g., since ties, sample anevers.	/epo/ttl	
, , ,	U. C. C. C. C. t. v. d. v.		
	U.S.G.S. Study DEC site Dossier		
	Phase II Investigation	•	

## SEPA

## POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 6-SAMPLE AND FIELD INFORMATION

L IDENTIFICATION
OF STATE ICE STE NUMBER
NY 0000514380

IL SAMPLES TAKEN			i		
	01 NUMBER OF	02 SAMPLES SENT TO	C3 ESTIMATED CATE		
SAMPLE TYPE	SUMPLES TAKEN				
GROUNDWATER	8	Compu Chem	8/84		
SURFACE WATER	5	ES laboratory	presently available		
WASTE					
AIR					
RUNOFF					
SAIT					
SOIL					
VEGETATION -					
OTHER sediment	3	Compu Chem	8/84		
IIL FIELD MEASUREMENTS TA	KEN				
on TYPE Downhole gamma	02 COMMENTS				
logging	Performed	in wells to define soil stratigraphy			
Geophysical survey	Performed	to locate disposal trench boundaries			
Permeability test-	Performed	in wells to evaluate rate of contaminant move	ement		
IV. PHOTOGRAPHS AND MAP	s .				
OI TYPE O GROUND C AERIA		02 IN CUSTODY OF			
D3 MAPS   04 LOCATION OF MAPS   Dames & Moore office					
V. OTHER FIELD DATA COLLECTED (Provide narrange description)					
Soil samples were collected during the drilling of the seven sampling wells. Grain size analyses of selected samples were performed in the laboratory.					

VL SOURCES OF INFORMATION (Cite apecific referencies, e.g., auto fine, sample analysis, records)

Phase II investigation

	5	OTENTIAL HAZA	RDOUS WASTE SITE	I. IDENTIF	
SEPA	•		CTION REPORT	O1.STATE D2 SITE NUMBER	
COLI I'I	•		ER INFORMATION	NY (	0000514380
	<del></del>		·	····	
II. CURRENT OWNER(S)	·		PARENT COMPANY (Excursion)		·
DI NAME		C2 D+8 NUMBER	OB NAME		C9 D+B NUMBER
Town of Wheatfield		•	,		
03 STREET ADORESS (P. O. BOX, AFD F. HC.)		C4 SIC CODE	10 STREET ADDRESS (P. O. Bos. RFD #, etc.)		11 SIC CODE
2800 Church Road					
os ary	OB STATE	C7 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
N.Tonawanda	NY	14120		- 1	
OI NAME	<del>1 - :</del>	C2 D+6 NUMEER	08 NAME	1	09 D+8 NUMBER
UI ROME		CZ DTB NOMECH	OB NAME	•	
	•-	1			1
03 STREET ADDRESS (P. O. Box, RFD P. MC.)		C4 SIC COCE	10 STREET ADDRESS (P O. Box AFD P. MC.)		11 SIC CODE
	•	•	· ·		,
os City	OB STATE	07 ZIP CODE	12017	13 STATE	14 ZIP CCDE
				l	
01 NAME	<del></del>	02 D+8 NUMBER	D8 NAME		OP D+3 NUMBER
					•
02 CTDCTT 1000CCC 10 4 4 4 4 4 4		l la cia cons			11SIC CODE
03 STREET ADDRESS IP Q. 502, AFD 4. orc.)		04 SIC CODE	10 STREET ADDRESS (P. O. Box, RFD #. enc.)		I I SIC CODE
os CITY .	06 STATE	07 ZP CODE	12 CITY	13 STATE	14 ZIP CODE
	1		ł		İ
01 NAME		02 D+B NUMBER	08 NAME .		C9D+8 NUMBER
	ř	}			
O3 STREET ADDRESS (F.C. Box, RFD #, arc.)		I C4 SIC CODE	10 STREET ADDRESS (P.O. dox, RFD #. erc.)		11 SIC CODE
	•				
	;				
OS CITY	108 STATE	07 ZP CODE	12 CTY	13 STATE	14 ZIP CODE
	† ·				
IIL PREVIOUS OWNER(S). (Lest most recent frat)	•		IV. REALTY OWNER(S) IN ADDICAGO IS IN MICE	recent first)	
O1 NAME.		02 D+8 NUMBER	OI NAME		02 D+6 NUMBER
•	•	:• .	7		
O3 STREET ADCRESS (P. O. BOL, AFD P. OFL)	<del></del>	04 SIC CODE	G3 STREET ADDRESS (P.O. SOL AFD F. MC.)	•	04SIC CODE
				•	
05 CITY	OBSTATE	07 ZIP CODE	05 CITY	IOR STATE	97 ZIP CODE
· ·		0, 21 002		10031212	0.2. 0.5
	<u> </u>		los wars		
O1 NAME		C2 D+8 NUMBER	O1 NAME		02 D+8 NUMBER
		<u> </u>		<del></del>	<u> </u>
03 STREET ADDRESS (P.O. Box. RFD . +rc.)	•	04 SIC CODE	03 STREET ADDRESS (P O. BOL. RFD 4. erc.)		04 SIC CODE
•					
05 CTY	DE STATE	07 ZLP CODE	05 CITY	OB STATE	07 ZIP CODE
			1.		1
O1 NAME	d	02 D+8 NUMBER	OT NAME	<del></del>	02 D+8 NUMBER
_			1.		1
03 STREET ADDRESS (P.O. BOX RFD P. orc.)	*	04 SIC CODE	03 STREET ADORESS (P.O. Son. AFD P. OK.)		04 SIC COD€
OUT OF FEMALE PRODUCTIONS IN SOME FIX WAS A STORY			me militari complicate to an armiting and agent		
	12.7.2			100 000	10000
osaty -	08STATE	97 ZIP COD€	05 CITY	COSIATE	07 ZIP CODE
	1		•	1	1

New York State Tax Records

SEPA		SITEINSPE	ARDOUS WASTE SITE CTION REPORT ATOR INFORMATION	L IDENTIFIC.	
IL CURRENT OPERATOR IFTE TO A COM	event from swnerg		OPERATOR'S PARENT COMPA	NY (1/200-capie)	
1 NAME	jo:	D+8 NUMBER	10 NAME	11	D-5 NUMBER
None.	-	•	1		•
DI STREET ADDRESS IP D. ROS, AFD F. OIC.		04 SHC CODE	12 STREET ADDRESS (P.O. BOL RED ., MEL)		13 SIC CODE
S CITY	OE STATE O	7 ZIP CODE	34 CITY	15 STATE 16	ZP CODE
S YEARS OF OFEFATION OF NAME OF O	OWNER				
IL PREVIOUS OPERATOR(S)	t recent first; promos only i	Citieran from owner)	FREVIOUS OPERATORS' PARE	NT COMPANIES IN ACC	de al 44
Niagara Sanitation	• 1	2 D+ 8 NU45ER	1C NAME	11	RBAMUN 5+C
DE STREET ADDRESS (P. O. Sor. RFD.P. MC.)		04 SIC CODE	12 STREET ADDRESS (P.O. BOL RFD #, etc.	.,	13 SIC CODE
N. Tonawanda	OS STATE O NY	7 ZP CODE	14 GIY	15 STATE 10	ZIP CODE
BYEARS OF OPERATION DE NAME OF C	WNER DURING THIS I	OOIRE			
11 NAME		2 D+8 NUMEER	10 NAME	111	F38MUN 6+0
STREET ADORESS (P. O. SOL, AFD P. ME.)		C4 SIC CODE	12 STREET ADDRESS (P.O. 2014, RFD P. 44C.)	)	13 SIC CODE
scry	CE STATE O	7 ZIP CODE	14 011	15 STATE 16	S ZIP CODE
8 YEARS OF CPERATION OR NAME OF C	OWNER DURING THIS	PERIOD:		<del></del>	
1 NAME	l°	2 D+B NUMBER	1C NAME	V	1 O+B NUMBER
STREET ADDRESS (P.O. Soc. AFD F. ore.)		04 SIC CODE	12 STREET ADDRESS (P. O. BOX. AFD +, erc.	,	13 SIC CODE
IS CITY	OS STATE O	7 ZP CODE	14 CITY	15 STATE 1	6 ZIP CODE
OB YEARS OF OPERATION OR NAME OF C	OWNER DURING THIS	PERIOD			
IV. SOURCES OF INFORMATION (C	Ra apycific references, e.g	., state ffee, sample analy	PLS, PAPORTEI		
Niagara C	ounty Depar	tment of H	ealth, 1981		

	LUZA	
200		
*. <i>U</i>		L

## POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

		TIFICATION
į	GI STATE	CE SITE NUMBER
	NY	0000514380

COLITY	PART	9 - GENERATORIT	RANSPORTER INFORMATION	NY	0000514380
II. ON-SITE GENERATOR				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
01 NAME		02 D+B NUMBER			
None.					
C3 STREET ADURESS (P D. Rox RFD #, HC.)	<del></del>	04 SIC CODE			
os aiy	DE STATE	07 ZIP CODE			
III. OFF-SITE GENERATOR(S)		<u> </u>		M	
OI NAME		02 D-5 NUMBER	O1 NAME .		C2 D+8 NUMBER
Hooker Chemical			Niagara Falls Air Fo	rce Base	
03 STREET ADDRESS (P.D BOL RED P. HE.)		04 SIC CODE	03 STREET ADDRESS (P O. BOX AFD #, HC)		04 SIC CODE
•	·	• •			
Niagara Falls	06 STATE NY	07 ZP CODE	oscm Niagara Falls	ob state NY	O7 ZP CCDE
O1 NAME	<del> </del>	02 D+6 NUMBER	01 NAME		C2 DT 5 NUMBER
Bell Aerospace			Canborumdum		
03 STREET ADDRESS (P 0. 202, RFD 4, ore.)		04 SIC CODE	O3 STREET ADDRESS (P O. Soc. AFO o, om.) Buffalo Ave		94 SIC CODE
es any	OB STATE	07 ZIP CODE	oscny Niagara Falls	OB STATE NY	07 ZIP CODE
IV. TRANSPORTER(S)		<u> </u>		1	<b>1</b>
01 NAME Niagara Sanitation C	o. :	02 D+8 NUMBER -	01 NAME		02 D+8 NUMBER
O3 STREET ADDRESS (P.O. SOL, RFD 4, etc.)		04 SIC CODE	C3 STREET ADDRESS (P O. SCA. AFD 4, orc.)		C4 SIC CCDE
05 CITY	OB STATE	07 ZF CODE	05 CTY	OB STATE	07 ZIP COCE
N. Tonawanda	NY				7
01 NAME		02 D+6 NUMBER	01 NAME		02 D+8 NUMBER
03 STREET ADDRESS IP O BOL AFD 4. MC.)	· · · · · · · · · · · · · · · · · · ·	C4 S/C CODE	03 STREET ADDRESS IP D. Soz. AFD #. HELI	, , , , , , , , , , , , , , , , , , ,	04 SIC CCOE
05 CITY	06 STATE	07 ZIP COD€	OS CITY	OB STATE	07 ZIP CODE
V. SQURCES OF INFORMATION (CA. M	wate returness.	e.g., state free, sembre eners	я, госопа)		<u> </u>

Other off-site generator: Frontier Chemical

## SEPA

# POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 10 - PAST RESPONSE ACTIVITIES

L IDENTIFICATION

01.State | G2 STE NUMBER

NY 0000514380

	PART 10 - PAS	ST RESPONSE ACTIVITIES		11 0000314300
IL PAST RESPONSE ACTIVITIES			<del></del>	
01 (I A. WATER SUPPLY CLOSED		C2 DATE	03 AGENCY	
04 DESCRIPTION	No			
	No.			
01 G B. TEMPORARY WATER SUPPLY FR	OVIDED	02 DATE	03 AGENCY	
04 DESCRIPTION	No.			
01 C. PERMANENT WATER SUPPLY PR 04 DESCRIFTION	OVICED	02 DATE	03 AGENCY	
	No.	A compared to the compared to		
01 D. SPILLED MATERIAL REMOVED			03 AGENCY	-
04 DESCRIPTION		C2 DATE	03 AGENCY	•
•	No.	· •		
01 C E CONTAMINATED SOIL REMOVED		02 DATE	03 AGENCY	
04 DESCRIPTION .			007323.001	
·.	No.			
01 D F. WASTE REPACKAGED		02 DATE	03 AGENCY	
04 DESCRIPTION				
	No.			
01 [] G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION	No	02 DATE	03 AGENCY	
	No.	•		
OL C. M. CH CHE CHOM				-
01 D H. ON SITE BURIAL. 04 DESCRIPTION	No.	02 DATE	03 AGENCY	_
				·
01 EL IN SITU CHEMICAL TREATMENT		C2 DATE	03 AGENCY	
04 DESCRIPTION	No.		W AGENC!	
	· .	•		
01 D J. IN STU BIOLOGICAL TREATMENT		02 DATE	, 03 AGENCY	
04 DESCRIPTION .	No.		•	
01 C K. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION		C2 DATE	03 AGENCY	
	No.			
01 C L ENCAPSULATION		00.0475		
04 DESCRIPTION		02 DATE	03 AGENCY	
•	No.			
01 D M. EMERGENCY WASTE TREATMENT		02 DATE	03 AGENCY	
04 DESCRIPTION				
	No.			
01 C N. CUTOFF WALLS		02 DATE	03 AGENCY	
04 DESCRIPTION	No.			
		•		<u> </u>
01 D O. EMERGENCY DIKING/SURFACE W. 04 DESCRIPTION	ATER DIVERSION	02 DATE	03 AGENCY	
O4 DESCRIPTION	•••	·		
·	No.			
01 D.P. CUTOFF TRENCHES/SUMP 04 DESCRIPTION	•	02 DATE	03 AGENCY	
•	No			
	No.			
01 [] Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION		02 DATE	03 AGENCY	
•	No.	•		
PA FORM 2070-13/7-811			···-	

	1	AC
1. 2.70		3/1
6. W.	1_1	4 1

# POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

L IDENTIFICATION

o1 STATE | 02 STE M. 12 CF | 14 380

(DI-11)	PART 10 - PAST	TRESPONSE ACTIVI	TIES	111 0000314380
II PAST RESPONSE ACTIVITIES (Comment)				
01 D. R. BARRIER WALLS CONSTRUCTED 04 DESCRIPTION		02 DATE	93 AGENCY	
No.			•	
01 C S. CAPPING/COVERING 04 DESCRIPTION		02 DATE	03 AGENCY	
Incomplet	e cover of was	te (trash)		
01 C T. BULK TANKAGE REPAIRED 04 DESCRIPTION		02 DATE	03 AGENCY	
No.			-	-
01 [] U. GROUT CURTAIN CONSTRUCTE 04 DESCRIPTION	- ·	02 DATE	03 AGENCY	
No.	المساحدة والمراجع المساحد			
01 D V. BOTTOM SEALED. 04 DESCRIPTION		02 DATE	03 AGENCY	
No.				
01 E W. GAS CONTROL 04 DESCRIPTION		02 DATE	03 AGENCY	
No.				
01 C X, FIRE CONTROL 04 DESCRIPTION		02 DATE	D3 AGENCY	
No.	•			
01 C Y. LEACHATE TREATMENT 04 DESCRIPTION		-02 DATE	D3 AGENCY_	
No.		•		
01 IJ Z AREA EVACUATED 04 DESCRIPTION NO.		02 DATE	03 AGENCY	
04 DESCRIPTION No.				
02-D 1. ACCESS TO SITE RESTRICTED		02 DATE	03 AGENCY	
04'DESCRIFTION No. Site	is surrounded	by incomplete	(although lock	ked) fence.
01 1 2. POPULATION RELOCATED		02 DATE	03 AGENCY_	
04 DESCRIPTION NO.		•		
01 G 3. OTHER REMEDIAL ACTIVITIES. 04 DESCRIPTION	- 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10	02 DATE	03 AGENCY	
None	<b>.</b>			
•				•
		•		

IIL SOURCES OF INFORMATION (Cre source references a.g., time fina, samore energies, records)

Site visits during Phase II investigation



# POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 11 - ENFORCEMENT INFORMATION

IL ENFORCEMENT INFORMATION		
ON PAST REGULATORY/ENFORCEMENT ACTION THES	Φ/so	

02 DESCRIPTION OF FEDERAL STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

IIL SOURCES OF INFORMATION (C) & SOURCE PROPERTIES AND A LABOR OF SOURCES

TABLE VI.1
IDENTIFICATION OF REMEDIAL ACTION METHODS (FIRST SCREENING)

METHOD	APPLICABLE	NOT APPLICABLE	COMMENTS
Air Emissions Controls		x	No air contamination detected.
Surface Water Controls	<b>x</b>		No surface water detected, however, site capping would eliminate ponding and reduce leachate generation. Also reduces public health risk for exposure by direct contact and fire and explosion hazard.
Ground Water Controls	x		Ground water contamination not confirmed. Additional sampling and analysis of monitoring wells is required.
Comtaminated Water and Sewer Lines		x	No susceptible municipal sewer or water lines.
Treatment		x	No treatment of air, water, wastes, sediment or soil required. Highest concentrations of metals detected in ground water samples are low enough for discharge to public sewer systems.

TABLE VI.2
PRELIMINARY SCREENING OF REMEDIAL ACTIONS (SECOND SCREENING)

ALTERNATIVE	APPLICABLE	NOT APPLICABLE	COMMENTS
Surface Water Controls	-		
Containment (capping)	X		Conventional, demonstrated relatively low cost technology for reducing leachate generation and minimizing public health risk by direct contact.
Grading	x		Site should be graded to promote surface runoff to drainage ditch north of landfill. Drainage ditch should be regraded and maintained to convey runoff away from site.
Revegetation	x		Revegetation stabilizes the surface of the site, and controls erosion of the cap.
Perimeter Fencing	x		Limits access to site to minimize public health risk and damage to the cap.
Ground Water Controls			•
Monitoring	x		Ground water contamination not confirmed, additional sampling and analysis of samples for metals is required.
Impermeable Barriers -Slurry Walls -Grout Curtains -Sheet Piling		x x x	Depth to bedrock reduces technical feasibility and increases cost. Fractures in dolomite bedrock may be flow path.
Permeable Treatment Bed		x	No practical means available to divert ground water to treat- ment bed. Synthetic ion exchange resins for metals removal may plug. Maintenance costly and difficult. Capital cost extremely high.
Ground Water Pumping		x	Ground water pumping is not feasible due to low permeability of soils above bedrock. Bedrock may yield water from fractures, but may not contain contaminant plume.
Leachate Control -Subsurface Drains -Drainage Ditches -Liners		X X X	Not practical as extensive soil excavation would be required for leachate control systems.

TABLE VI.3
ELEVATION OF POTENTIAL REMEDIAL ALTERNATIVES (THIRD SCREENING)

ALTERNATIVE	TECHNOLOGY	ENVIRONMENTAL IMPACT	PUBLIC HEALTH RISK	REGULATORY ACCEPTANCE	ENGINEERING JUDGEMENT COMMENTS RETAIN OPTION
Surface Water Controls	•				
Capping, Grading, Revegetation and Perimeter Fencing	n 3	3	3	3	Provides effective means YES for control of migration of contaminants off-site and reduces public health risk and fire and explosion hazard.
Ground Water Controls					
Monitoring :	3	2	3	2	Additional sampling and YES analysis for heavy metals would confirm or deny the existence of contamination. Present analytical results are inconclusive, however no significant contamination was found.

Legend:

<sup>1 =</sup> Unfavorable (i.e., high cost, severe environmental impacts, high health risks, poor regulatory compliance, unproven or difficult technology)

<sup>2 =</sup> Fair

<sup>3 =</sup> Favorable

# Table VI.4 Summary of Conceptual Remedial Cost Estimate Nash Road Landfill

Item No.	Description	Approximate Cost (1)
I.	Site dewatering and preliminary site work prior to grading, capping, revegetation and perimeter fencing	\$ 290,000
II.	Site grading and drainage	\$ 327,000
III.	Surface sealing and capping (1' thick clay cap)	\$ 592,000
IV.	Revegetation Topsoil (1'), seed and mulch	\$ 67,000
v.	Perimeter fence (4600') with two gates (6' high)	\$ 47,000
Subtotal		\$1,323,000
Contigency ( Engineering		\$ 397,000 \$ 265,000
Total Capita	l Cost	\$1,985,000

<sup>(1)</sup> Costs are in 1984 \$

<sup>(2)</sup> These costs are considered preliminary conceptual costs.

### SECTION VI

### PRELIMINARY REMEDIAL ALTERNATIVES AND COST

### Introduction

The purpose of this conceptual remedial alternative evaluation is to identify potential remedial action technologies and prepare a conceptual cost estimate for the most likely remedial alternative for the Nash Road site. Due to the preliminary nature of the data available, any remedial alternative evaluation must be considered very preliminary and, hence, would be conservative. A more detailed remedial investigation and feasibility study would be required to better define design criteria and costs for remedial alternatives.

## Identification of Remedial Methods

The conceptual remedial alternatives considered for the Nash Road site were subjected to a three-tiered screening process. First, remedial action methods were screened to determine applicability to the site. The methods were selected to conform with the onsite actions for remediation of hazardous material releases, as presented in the National Contingency Plan. Remedial action methods were eliminated if they were considered unnecessary at the Nash Road landfill. The screening process and rationale for selection of engineering methods is summarized in Table VI.1. Based on this screening only surface water and ground water controls were retained for the second screening process.

## Second Screening of Remedial Actions

In the second screening process, the engineering methods identified in the first screening process were further evaluated. The results of the second screening of remedial actions are presented in Table VI.2.

Remedial actions for surface water controls which were retained after this screening process include capping, grading, revegetation and perimeter fencing. Although no on-site surface water contamination or migration of contaminants was indicated during the Phase II investigation, these actions are considered to be applicable since they will 1) reduce the potential for future releases to surface water, 2) protect the public health by eliminating exposure to hazardous substances by direct contact and 3) minimize the risk of fires.

Actions for containment and/or pumping of ground water were eliminated during this phase of the screening process because, although some analytical results of ground water samples collected as part of the Phase II investigation indicated slight metals contamination, the migration of significantly contaminated ground water from the site was not found. Furthermore, due to the geology of the site, these remedial actions would be technically difficult and/or expensive to implement. Only continued monitoring of ground water was retained for further consideration. Collection and analysis of ground water samples from on-site wells will confirm or deny the existence of significant heavy metals contamination.

## Evaluation of Remedial Alternatives

The third screening process involved a more detailed evaluation of several combinations of remedial actions that had passed the first two screening steps. Alternatives were scored in a general sense (unfavorable, fair, favorable) in each of five categories: technical feasibility, environmental impact, public health risk, and regulatory compliance. The total score for an alternative is not necessarily an indication of overall acceptability.

For example, alternatives may score high in all categories except regulatory compliance, and therefore would be eliminated. Conversely, the monitoring alternative is retained throughout, regardless of its rating, to act as the baseline (i.e., lowest) level of effort for comparison.

The basic elements of each of the five criterion are as follows:

## Technical Applicability

The technical applicability of a remedial action technology refers to its ability to achieve performance standards such as:

a) protection of the groundwater aquifer, and b) minimization of emissions. In addition, the ease of implementation is important. This criterion provides an effective means of reducing a very large number of alternatives to only those that are applicable from an engineering standpoint.

### Environmental Impact

The most important environmental impacts are the potentials for surface water, ground water and air emission contamination. Each alternative was screened in consideration of its ability to prevent contamination of these three media.

### Public Health Risk

The key concern of the Superfund program is protection of the public health. Potential areas of risk are: contamination of ground water supplies and surface water supplies, emissions of volatile hazardous compounds to the atmosphere, spills of hazardous substances during transportation to acceptable disposal sites, exposure of the public or workers to toxic substances during cleanup operations, accidental or purposeful entry by unauthorized personnel into the sites and subsequent contact with hazardous wastes.

## Regulatory Compliance/Acceptability

The involved regulatory agencies and their means of responsibility are as follows:

New York Department of Environmental Conservation (Albany)

New York Department of Environmental Conservation, Region 9

(Bufffalo)

U.S. Environmental Protection Agency, Region II (New York)

Preferred alternatives must comply with all regulatory requirements and have regulatory agency support.

The evaluation of potential remedial alternatives for surface

water controls and ground water controls is presented in Table VI.3. Capping, grading, revegetation and limiting site access by erection of a fence around the perimeter of the site is judged to be an appropriate remedial alternative for controlling migration of contaminants off-site, preventing human contact with hazardous substances and reducing the possibility of fires or explosions.

Collection and analysis of additional ground water samples is considered to be an appropriate remedial alternative, to determine whether or not significant contamination of ground water exists on the site. Although this remedial alternative scored only fair for environmental impact and regulatory compliance, since slight lead contamination (concentration in excess of state standards) was detected in one of two ground water samples; the public health risk is low since the ground water is not used for drinking water. This alternative is judged to be the appropriate level of response, based on existing data.

## Conceptual Cost Estimate

A conceptual cost estimate was prepared for the alternatives which were developed for surface water controls and ground water controls. The following are assumptions which were made to generate a preliminary cost estimate for capping the landfill. The area of the landfill is estimated to be approximately 25 acres in size. The former disposal trench would have to be dewatered and filled prior to capping. Vegetation would need to be cleared and the site would have to be graded and recontoured prior to capping. The cap would consist of a one-foot layer of

compacted clay. The drainage ditch north of the site would require reconstruction after capping of the site. Revegetation would consist of a layer of topsoil, covered with grass seed and mulch. The perimeter fence will surround the 25-acre site and be six feet high. Using the above assumptions, published cost information, a contingency of 30% and engineering of 20%, the preliminary capital cost for this alternative is 2 million dollars. (Table VI.4).

The cost of the ground water monitoring alternative considers the collection of two rounds of samples from the monitoring wells and from the Osterman well. These samples would be filtered in the field to reduce variability in the analytical results. The estimated cost for collection and analysis for heavy metals of two rounds of samples is \$11,100.

### REFERENCES

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